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Patterson Brixius Creek Watershed Project,
Site I
Broome County
Patterson Creek

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and visual inspection of the Site 1 Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

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The discharge capacity of the spillways is adequate for the PMF (Probable Maximum Flood).

The following remedial actions must be completed within 1 year from notification to the owner:

1. Eliminate the pedestrian and vehicular traffic on the embankment and the auxiliary spillway, backfill all depressions and reseed these areas.

2. Repair the erosion and reseed the areas adjacent to the impact basin, along the toe of the embankment, and between the right abutment and the auxiliary spillway outlet. Also remove the stockpiles in the channel and near the outlet of the auxiliary spillways and reseed.

3. Recaulk the joint between the service spillway pipe and the impact basin wall. Repair the concrete surfaces of the impact basin and the left animal guard.

4. Remove the vegetation along the left slope of the auxiliary spillway and on the banks of the downstream channel. Remove the debris on the approach channel of the auxiliary spillway. Provide a program of periodic cutting and mowing of the dam and appurtenances.

5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PATTERSON, BRIXIUS, GREY CREEK
WATERSHED PROJECT - SITE 1
I.D. No. NY 698
DEC #86B-3457
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Patterson Brixius Grey Creek Watershed Project, Site 1 I.D. No. NY 698
State Located:	New York
County Located:	Broome
Stream:	Patterson Creek (tributary of the Susquehanna River)
Date of Inspection:	July 23, 1980

ASSESSMENT

1

The examination of documents and visual inspection of the Site 1 Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

The discharge capacity of the spillways is adequate for the PMF (Probable Maximum Flood).

The following remedial actions must be completed within 1 year from notification to the owner:

1. Eliminate the pedestrian and vehicular traffic on the embankment and the auxiliary spillway, backfill all depressions and reseed these areas.

2. Repair the erosion and reseed the areas adjacent to the impact basin, along the toe of the embankment, and between the right abutment and the auxiliary spillway outlet. Also remove the stockpiles in the channel and near the outlet of the auxiliary spillways and reseed.

3. Recaulk the joint between the service spillway pipe and the impact basin wall. Repair the concrete surfaces of the impact basin and the left animal guard.

4. Remove the vegetation along the left slope of the auxiliary spillway and on the banks of the downstream channel. Remove the debris on the approach channel of the auxiliary spillway. Provide a program of periodic cutting and mowing of the dam and appurtenances.

5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

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George Koch

George Koch
Chief, Dam Safety Section
New York State Department of
Environmental Conservation
NY License No. 45937

Approved By:

Col. W. M. Smith Jr.
New York District Engineer

Date: 30 SEP 80

Photo #1
Overview of Patterson Brixius Site 1 Dam

(15) DACW51-79-C-0021 (11) Aug 80

(12) 101

(6) PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PATTERSON, BRIXIUS, GREY CREEK
WATERSHED PROJECT, SITE 1 (Inventory Number NY698)
~~I.D. No. NY 698~~
~~DEC #0GB-3457~~
SUSQUEHANNA RIVER BASIN,
BROOME COUNTY, NEW YORK
Phase I Inspection Report,

(10) George Koch

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Site 1 Dam consists of a 1300 feet long homogeneous earth embankment with an auxiliary spillway located at the right end of the embankment in a cut section beyond the abutment of the embankment. The maximum height of the dam is 65 feet. The embankment has a crest width of 20 feet, an upstream slope of 1 vertical on 3 horizontal, and a downstream slope of 1 on 2.5. Two berms, located near the principal spillway riser on the upstream slope, were incorporated into the design.

The auxiliary spillway is a vegetated earth channel, with a bottom width of 340 feet and side slopes of 1 on 3 (left slope) and 1 on 2 (right slope).

The principal spillway is a rectangular concrete riser which extends above the upstream slope near the toe of slope. The riser is topped by a triangular trash rack, the sides of which form a drop inlet, which is utilized during high reservoir levels. Under low flow conditions, a rectangular low stage inlet, in the upstream face of the riser, controls the reservoir level.

A 30 inch diameter reinforced concrete pipe controls the flow between the riser and the impact basin located at the toe of the dam. An 18 inch diameter pipe, with a manually operated slide gate, the controls of which are located atop the riser, serve as the reservoir drain system. → to p. iv

b. Location

The dam is located on Patterson Creek, a tributary of the Susquehanna River, approximately 1 mile north of Endwell, New York.

c. Size Classification

The dam is 65 feet high and is classified as "intermediate" in size (40 to 100 feet in height).

d. Hazard Classification

The dam is classified as high hazard because of its location above Endwell, New York.

e. Ownership

The dam is owned and operated by the County of Broome, New York.

f. Purpose

The dam is a floodwater retarding structure.

g. Design and Construction History

The dam was designed and construction supervised by the U.S.D.A. Soil Conservation Service (SCS). The dam was completed in 1968. The SCS office for Broome County, located at the Broome County Airport, has all design and construction information.

h. Normal Operating Procedures

Normal flows are discharged through the principal spillway. This structure has sufficient capacity to store and discharge a 100 year flood without use of the auxiliary spillway. Flow in excess of the 100 year storm will be discharged through the auxiliary spillway.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	4.42
b. Discharge at Dam (cfs)	
Principal spillway at Maximum high water	160
Principal spillway at auxiliary spillway crest elevation	132
Reservoir drain at Normal water elevation	45
Maximum known flood	
Total discharge at Maximum high water	17,500
c. Elevations (USGS Datum)	
Top of dam	1041.3
Auxiliary spillway crest	1034.0
Principal spillway crest	1016.0
Low stage inlet	998.0
Reservoir drain	981.9
d. Reservoir (acres)	
Surface area at top of dam	67.2
Surface area at crest of auxiliary spillway	51.2
Surface area at crest of principle spillway	24.1
e. Storage Capacity (acre feet)	
Top of dam	1280.
Auxiliary spillway crest	905.
Principal spillway crest	285.

f. Dam

Type: Homogeneous earth fill, with keyed cutoff and drain parallel to axis of dam.

Length (ft.)	1250.
Slopes: upstream	3H to 1V
downstream	2.5H to 1V
Crest Width (ft.)	20.

g. Principle Spillway

Type: Two stage reinforced concrete drop inlet structure. Low level orifice at elevation 998 and 15.0 weir at elevation 1016.0.

Weir length:	15.
Height	35.

h. Auxiliary Spillway

Type: Grass lined channel having trapezoidal cross section.

Bottom Width	340.
Length Control Section	50.

i. Reservoir Drain

Type: 18 inch diameter cast iron pipe with reinforced concrete inlet.

Control: Manually operated valve located in the spillway riser.

SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

The Patterson, Brixius, Grey Creek Watershed Project Dam No. 1 is located in the glaciated portion of the "Appalachian Uplands" (northern extreme of the Appalachian Plateau) physiographic province of New York State. These uplands were formed by dissection of the uplifted but flat lying sandstones and shales of the middle and upper Devonian Catskill Delta. The plateau surface is represented by flat-topped divides with drainage generally southwest toward the Susquehanna River system.

Glacial cover is generally thin, although some north-south valleys are so thick that they are completely buried. The present surficial deposits have resulted primarily from glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation, approximately 11,000 years ago.

2.2 SUBSURFACE INVESTIGATION

A subsurface investigation was conducted by the Soil Conservation Service in 1965. This program consisted of 14 drill holes and 20 test pits at locations along the dam, auxiliary spillways, structural elements, and borrow area. Applicable subsurface information is included in Appendix F, Drawings #15 and 16.

In general, the soils in the vicinity of the dam are of glacial till or glacial lacustrine origin, and are silty gravel, clayey gravels, and sandy silts over shale bedrock. The permeability of these soils is low.

2.3 EMBANKMENT AND APPURTENANT STRUCTURES

The dam was designed and constructed under the supervision of the Soil Conservation Service. "As-Built" drawings of this dam are on file at the SCS office in Broome County. Selected drawings of the dam and appurtenances are included in Appendix F. The dam is composed of homogeneous earth fill, the maximum height of which is 65 feet, a cut-off trench having side slopes of 1 on 1, and a foundation drain parallel to the axis of the dam near the downstream toe. A reinforced concrete riser serves as the principal spillway and a vegetated channel serves as the auxiliary spillway.

2.4 CONSTRUCTION RECORDS

Complete construction records are available from the SCS office in Broome County. No major construction changes were instituted.

2.5 OPERATION RECORD

Since the dam is an ungated floodwater retarding structure, no operating records are maintained regarding water levels. During periods of extreme rainfall, SCS personnel do monitor the reservoir.

2.6 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from Mr. Gary Page, Project Engineer for SCS in Broome County, and Mr. Donald Lake, Head of the SCS Design Section in Syracuse, New York. This information appears to be adequate and reliable for Phase 1 Inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Site #1 Dam was conducted on July 23, 1980. The weather was cloudy and the temperature ranged in the low 70's. The reservoir level at the time of the inspection approximately the invert of the low stage inlet of the service spillway riser (El.998.0).

b. Earth Embankment

No signs of distress were observed in connection with the earth embankment and no signs of misalignment, sloughing, seepage, subsidence, surface cracking or undesirable growth were noted. While no riprap was in use on the upstream slope for wave protection, no erosion was apparent. (See Photos #1 & 2)

Pedestrian and vehicular paths were noted on the crest and slopes of the embankment. These paths are a potential source of erosion. (Photos 5 & 6)

Near the downstream toe of the embankment on both sides of the impact basin erosion was evident. This erosion appears to be related to runoff from the embankment and the adjacent ball fields. (Photo #3)

Regrading in the area between the embankment and the auxiliary spillway was observed. A stockpile of soil was also evident near the outlet of the auxiliary spillway. Since no vegetation had been established on the regraded surface, erosion and slight ponding of runoff (from a previous storm) was noted. (Photo #5)

An internal drainage system composed of 2 - 8 inch diameter pipes surrounded by "drain fill" and extending parallel to the axis of the dam, provides drainage at the embankment-subgrade contact. These pipes exit through the concrete walls of the impact basin. Discharge from these pipes was 1 to 2 gpm each. The flow was clear. The animal guard on the left pipe was broken. (See Photo #3)

c. Service Spillway

The service spillway is generally in good condition. The maximum joint extension of the pipe is 0.5 inches. The joint between the pipe and the impact basin is open. The walls of the impact basin are slightly deteriorated. Calcification was noted from a crack or cold joint on the upstream wall about 1 foot above and to the right of the pipe. This area was dry at the time of the inspection.

d. Auxiliary Spillway

The grass lined service spillway beyond the right abutment is generally in good condition. Three ball fields were noted in the auxiliary channel, all with removable fences. Vehicular paths and soil stockpiles were noted in the channel. Vegetation was also evident on the slope between the auxiliary spillway and the embankment. (Photo #7)

e. Reservoir Drain

The 18 inch diameter reservoir drain pipe and manually operated slide gate, controls of which are located atop the riser, is reported to be operational.

f. Downstream Channel

The downstream channel below the impact basin is ripraped. Some vegetation was observed along the banks of this channel. (Photo #4)

g. Reservoir

There are no signs of instability or sedimentation problems within the reservoir area.

3.2 EVALUATION

The problem areas observed during the inspection which require remedial measures are as follows:

1. Pedestrian and vehicular traffic has created paths and depressions on the slopes of the embankment, at the abutments and in the auxiliary spillway channel. This traffic must be eliminated, the depressions filled and the area seeded to prevent erosion.

2. Erosion was evident near the toe of the embankment in the vicinity of the impact basin, at the right abutment, and between the auxiliary spillway outlet and the right abutment. These areas must be regraded and vegetation established as soon as possible.

3. Stockpiles of soil were observed in the auxiliary spillway channel and near the outlet of the channel. These stockpiles must be removed and the vegetation beneath the piles restored.

4. Recaulk the joint between the service spillway pipe and the wall of the impact basin.

5. The walls of the impact basin are slightly deteriorated and the left animal guard is broken. Repair the concrete surfaces of the impact basin and the animal guard.

6. Remove the vegetation on the slope between the right abutment and the auxiliary spillway channel, and along the banks of the downstream channel. Provide a program of periodic cutting and mowing of the dam and appurtenances. Also remove the debris in the approach channel of the auxiliary spillway.

7. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the low stage inlet of the service spillway. Downstream flows are limited by the 30 inch diameter service spillway pipe, except during extremely heavy runoff when the auxiliary spillway is in service. The dam provides 862 acre feet of flood storage between normal water level and the crest of the auxiliary spillway.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the County of Broome, New York. Maintenance of the dam is considered unsatisfactory as evidenced by the extensive vehicle and pedestrian paths which have initiated erosion on the slopes of the dam. In addition, erosion at the toe of the embankment near the impact basin and debris along the toe of the downstream slope were noted.

4.3 WARNING SYSTEM

There is no warning system in effect or in preparation.

4.4 EVALUATION

The dam and appurtenant structures have not been maintained in satisfactory condition as noted in "Section 3: Visual Inspection."

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The drainage area above the Patterson Brixius Site 1 dam is 2829 acres or 4.42 square miles. Delineation of the watershed was made using the USGS 7.5 minute quadrangle, Maine, New York. The watershed consists of woodlands and some residences in a primarily rural setting. Relief ranges from moderate to fairly steep.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 computer model. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation (PMP) was 21.0 inches (24 hrs., 200 sq. mi.) from Hydrometeorological Report #33 in. accordance with recommended guidelines of the Corps of Engineers. The floods selected for analysis were 20, 40, 50, 60, 80, and 100% of the Probable Maximum Flood (PMF) flows. The PMF inflow of 7082 cfs was routed through the reservoir with no significant attenuation.

5.3 SPILLWAY CAPACITY

The spillway is a reinforced concrete drop inlet structure, 35 feet in height. It creates a weir length of 15 feet at elevation 1016.0, approximately 25. feet below top of dam. At auxiliary spillway crest elevation it has a capacity of 132 cfs. At top of dam, the service spillway and auxiliary spillway have a total capacity of 17,500 cfs.

5.4 RESERVOIR CAPACITY

The reservoir capacities at the crest of the spillway and the top of dam are 285 and 1280 acre feet respectively. Surcharge storage from spillway crest to auxiliary spillway crest and auxiliary spillway crest to top of dam are 2.63 and 1.59 inches of runoff.

5.5 FLOODS OF RECORD

The highest known water elevation was 1026.2 or 10.2 feet above the low level orifice (not yet reaching the service spillway crest). This occured during September 1975, the estimated outflow of this storm is 95 cfs.

5.6 OVERTOPPING POTENTIAL

The maximum capacity of the spillways is 17,500 cfs before overtopping would occur. This capacity passes the full PMF inflow of 7,083 cfs with 3 feet freeboard. The routed 1/2 PMF outflow is 3,457 cfs.

5.7 EVALUATION

The spillway has a capacity to pass the total PMF and attenuate storm of greater frequency.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of distress were observed in connection with the earth embankment.

b. Design and Construction Data

A stability analysis was conducted by SCS during the design of the dam. The analyses were performed using the modified swedish circle method. The soil parameters assumed were γ_d = 122.8, γ_m = 137.0, γ_s=140.5, γ_b=78.0, ϕ= 27° c = 300. The results of these analyses are as follows:

Condition	Minimum Factor of Safety
1. Upstream slope = 1:3, full draw down 15' berm at el. 1006 & 10' berm at el. 995	1.45
2. Downstream slope = 1:2.5, drain at c/b = 0.6 No berm	1.58

The calculated factors of safety for this dam are in excess of the minimum factors recommended by the Corps of Engineers. The dam is, therefore, considered to have adequate factors of safety for stability. Further information concerning this analysis is included in Appendix E.

c. Post Construction Changes

No post construction changes were initiated. Removable fences for sporting activities have been installed in the auxiliary spillway.

d. Seismic Stability

The dam is located in Seismic Zone 1. Therefore, a seismic analysis is not warranted.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of the Patterson Brixius Grey Creek Watershed Project Site 1 Dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is not considered to be unstable and appears capable of retarding floodwaters resulting from the PMF.

b. Adequacy of Information

The information reviewed appears adequate for Phase I Inspection purposes.

c. Need for Additional Investigation

No additional investigations are required at this time.

d. Urgency

Within 1 year of notification to the owner, the following remedial measures must be completed.

7.2 RECOMMENDED MEASURES

1. Eliminate the pedestrian and vehicular traffic on the embankment and auxiliary spillway, backfill all depressions and reseed these areas.

2. Repair the erosion and reseed the areas adjacent to the impact basin, at the toe of the right abutment, and the regraded area between the right abutment and the outlet of the auxiliary spillway. Also remove the stockpiles of soil in the auxiliary spillway channel and channel outlet, and reseed.

3. Recaulk the joint between the service spillway pipe and the impact basin wall. Repair the concrete surfaces of the impact basin, and repair the left animal guard.

4. Remove the vegetation along the left slope of the auxiliary spillway and on the banks of the downstream channel. Remove the debris in the approach channel of the auxiliary spillway. Provide a program of periodic cutting and mowing of the dam and appurtenances.

5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

APPENDIX A

PHOTOGRAPHS

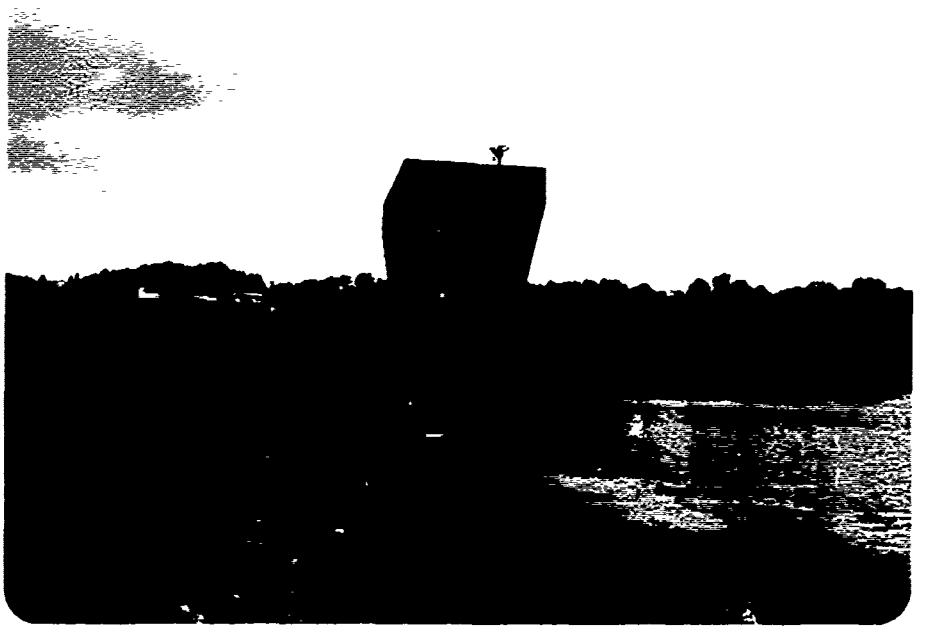


Photo #2
Upstream Slope & Riser

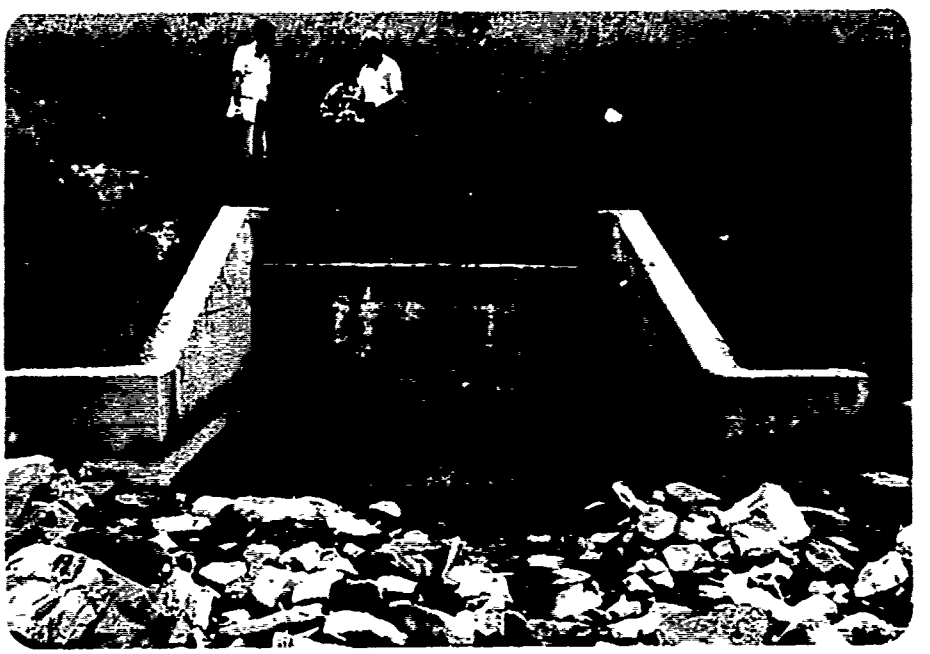


Photo #3
Impact Basin

Photo #4
Downstream Channel

Photo #5
Downstream Area
Viewed from Crest

Photo #6
Downstream Face - Left Abutment

Photo #7
Auxiliary Spillway & Right Abutment

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Patterson Brothers Gravel Creek S.No.1

Fed. I.D. # NY 698 DEC Dam No. EB-34157

River Basin Susquehanna

Location: Town Union County Broome

Stream Name Patterson Creek

Tributary of Susquehanna River

Latitude (N) 42° 8.2' Longitude (W) 76° 1.3'

Type of Dam Earth Embankment

Hazard Category "C" High

Date(s) of Inspection July 23, 1980

Weather Conditions Cloudy, Lo 70's°

Reservoir Level at Time of Inspection Approx Low Stage Inlet (El. 998.0)

b. Inspection Personnel Jamie C Vadeboncoeur, R.F McCurdy

c. Persons Contacted (Including Address & Phone No.)

Gary Page - Project Engr, SCS Binghamton

607-773-2751 Broome Co. Dept. Public Works

Donald Lobb 315-423-5505 Syracuse SCS

d. History:

Date Constructed 1968 Date(s) Reconstructed —

Designer Soil Conservation Service

Constructed By R D Bathgate Corp.

Owner Broome County, N.Y.

2) Embankment

a. Characteristics

(1) Embankment Material glacial till

(2) Cutoff Type earth

(3) Impervious Core none

(4) Internal Drainage System 2 8" diam cmp collected in impact basin, drain fill around pipes

(5) Miscellaneous

b. Crest

(1) Vertical Alignment good

(2) Horizontal Alignment good

(3) Surface Cracks none

(4) Miscellaneous bike and vehicular paths on crest, slight depressions resulting

c. Upstream Slope

(1) Slope (Estimate) (V:H) 1:3

(2) Undesirable Growth or Debris, Animal Burrows none

(3) Sloughing, Subsidence or Depressions depressions (slight) from vehicular & pedestrian travel.

(4) Slope Protection none - earth berms (relatively flat) at normal water level

(5) Surface Cracks or Movement at Toe unobservable

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2.5

(2) Undesirable Growth or Debris, Animal Burrows none

(3) Sloughing, Subsidence or Depressions depressions (slight) resulting from pedestrian & vehicular traffic erosion near toe at impact basin (both sides) from ball field runoff

(4) Surface Cracks or Movement at Toe none

(5) Seepage none

(6) External Drainage System (Ditches, Trenches; Blanket) none

(7) Condition Around Outlet Structure erosion on both sides of upstream wall due to runoff along toe from ball fields

(8) Seepage Beyond Toe none evident

e. Abutments - Embankment Contact

earth to earth contact

(1) Erosion at Contact erosion along toe from right abut ≈ 60' to left from recent regrading; some regraded & large p.b. of soil left

(2) Seepage Along Contact - none

near outlet of auxiliary spillway between sta 4 & 5 (right) some ponded H2O at toe near ball field from previous rain also some erosion in regraded areas

3) Drainage System

a. Description of System 8" cmp parallel to axis of dam & outfalling in walls of impact basin

b. Condition of System good - some guard in left pipe broken

c. Discharge from Drainage System Approx 1 to 2 gpm from each pipe

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) none

5) Reservoir

a. Slopes good condition

b. Sedimentation none reported

c. Unusual Conditions Which Affect Dam —

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) immediately below dam
Low folds of highway embankment Homes below embankment

b. Seepage, Unusual Growth vegetation in downstream channel

c. Evidence of Movement Beyond Toe of Dam none

d. Condition of Downstream Channel riprapped

7) Spillway(s) (Including Discharge Conveyance Channel)

Standard SCS Design

a. General Service Spillway - riser, pipe & impact basin
auxiliary spillway - grass lined channel

b. Condition of Service Spillway excellent.
impact basin walls slightly deteriorated - joint between wall & service spill. pipe open - needs caulking.
calcification on upstream wall of impact basin ≈ 1' above & right of pipe from slight crack or possible cold joint - dry during inspection. Pipe joint extension = max ½"

c. Condition of Auxiliary Spillway generally good - ball fields in sloped sections w/ riprap bases - sed pile - 4 benches some debris in approach channel. vegetation in riprapped slope between aux. & right abut.

d. Condition of Discharge Conveyance Channel good - pedestrian & vehicular paths in aux. spillway channel have created depressions

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal ✓ Other _____

Size: _____ Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): Unobservable _____

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (Describe): _____

9) Structural

a. Concrete Surfaces generally good
some slight deterioration of impact basin walls

b. Structural Cracking none

c. Movement - Horizontal & Vertical Alignment (Settlement)
none evident

d. Junctions with Abutments or Embankments
adequate

e. Drains - Foundation, Joint, Face drains operational

f. Water Passages, Conduits, Sluices good condition

g. Seepage or Leakage none evident

h. Joints - Construction, etc. joint bet pipe (service spill) & impact wall requires caulking

i. Foundation unobservable

j. Abutments n/a

k. Control Gates operational

l. Approach & Outlet Channels good condition

m. Energy Dissipators (Plunge Pool, etc.) good condition

n. Intake Structures good condition

o. Stability appears acceptable

p. Miscellaneous -

APPENDIX C

HYDROLOGIC / HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1041.3	6[illegible].2	1[illegible]50
2) Design High Water (Max. Design Pool)	1038.0	60.2	10[illegible].9
3) Auxiliary Spillway Crest	1034.0	51.2	9[illegible]5
4) Pool Level with Flashboards	—	—	—
5) Service Spillway Crest	1016.0	24.1	285

998.0 (Invert outlet)

DISCHARGES

	Volume (cfs)
1) Average Daily	10.
2) Spillway @ Maximum High Water	16[illegible]
3) Spillway @ Design High Water	152
4) Spillway @ Auxiliary Spillway Crest Elevation	132
5) Low Level Outlet	[illegible]5
6) Total (of all facilities) @ Maximum High Water	17,500
7) Maximum Known Flood	
8) At Time of Inspection	4 [illegible]

CREST: ELEVATION: 1041.3

Type: homog. earth fill

Width: 20' Length: 1850'

Spillover drop inlet service, grass lined channel auxiliary

Location center, right abutment

SPILLWAY:

SERVICE		AUXILIARY
1016.	Elevation	1034.
drop inlet	Type	grass lined channel
2.5 x 7.5'	Width	340'
	Type of Control	
✓	Uncontrolled	✓
	Controlled:	
—	Type (Flashboards; gate)	—
—	Number	—
—	Size/Length	—
	Invert Material	vegetated
	Anticipated Length of operating service	2 hrs.
316' conduit	Chute Length	—
75	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	3:1 slope

Type : None

Location: _____

Records:

Date - _____

Max. Reading - —

FLOOD WATER CONTROL SYSTEM:

Warning System: None

_____

Method of Controlled Releases (mechanisms):

only controlled release through 18" drains.

_____

DRAINAGE AREA: 4.42 mi.²

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: some development, all rest farm, etc. rural

Terrain - Relief: rolling to steep slopes

Surface - Soil: fair permeability

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

fair runoff potential - steep - heavy.
increase in residential

Potential Sedimentation problem areas (natural or man-made; present or future)

none

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

None

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: none

Elevation:

Reservoir:

Length @ Maximum Pool 3700 ft. (Miles)

Length of Shoreline (@ Spillway Crest) 1.00 mi. (Miles)

Patterson Brothers Site No 1

DA 4.42 mi.

L = 4.17 mi.

L_{ca} = 1.70 mi

C_t = 2.0 or slightly lower due to steepness

$t_p = C_t (L \times L_{ca})^{0.3}$

$= 2.0(4.17 \times 1.70)^{0.3} = 3.6$ hrs.

$t_r = \frac{t_p}{5.5} = \frac{3.6}{5.5} = 0.65$

$T_p = t_p + 0.5(t_r) = 3.925$ hr.

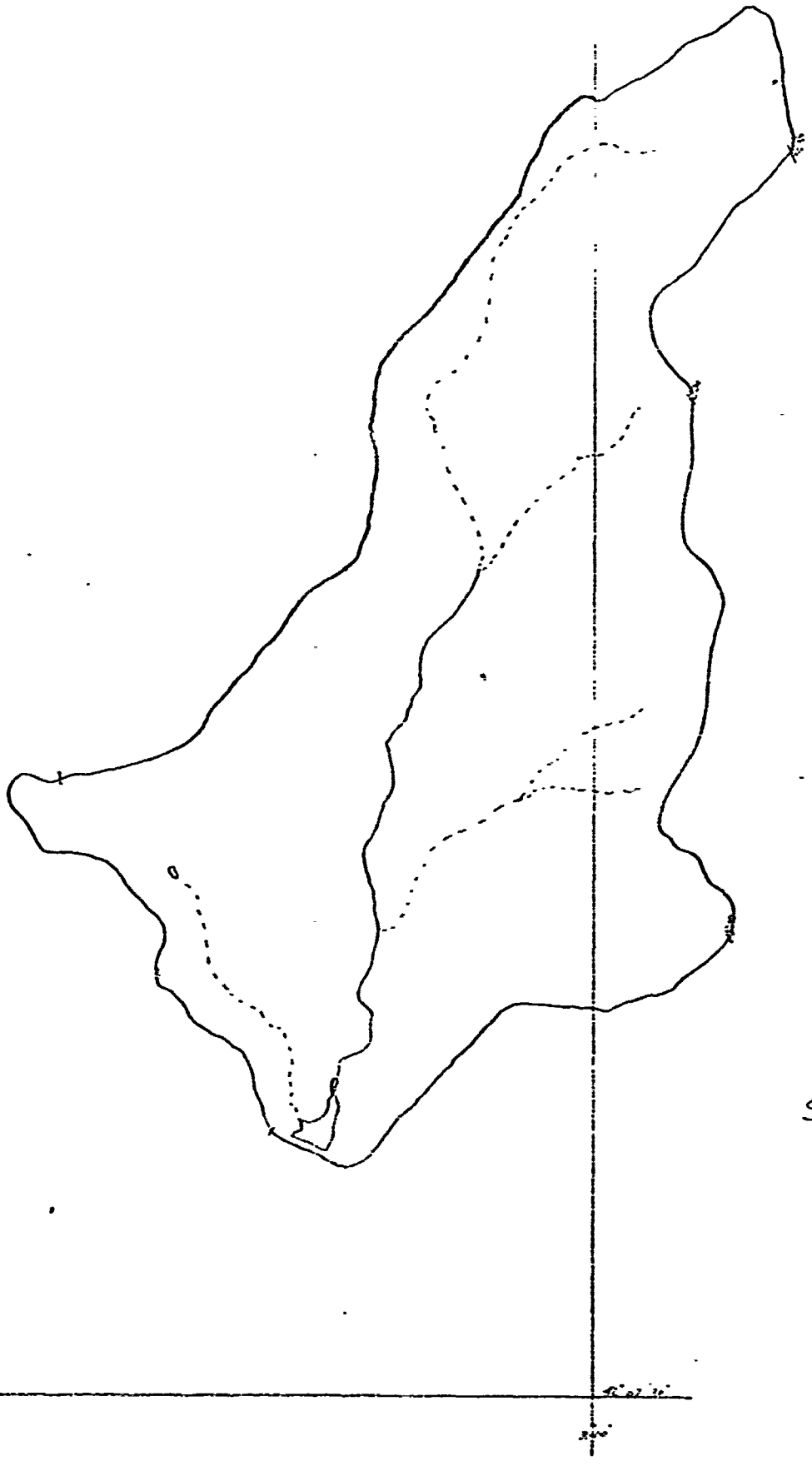
$C_p = 0.625$

Rainfall: PMP (HMR 55) 21.0" | 6 hr: 111 | 12 hr: 123 | 24 hr: 133 | 48 hr: 142

Spillway/Reservoir Capacities:

	EL (SCS)	Q (cfs)	≤ (ac Ft.)
	9[illegible]	—	0
invert of orifice	998.0	-	43.4
prim. spwy riser	1016.0	50	285.0
emerg. " crest	1034.0	132	905.0
design high ℄	1038.0	6210	1069.0
T of Dam	1041.3	17500	1280.0

L = 1250' C = 3.0



1.92 mi.^{2}

$L = 4.5\left(\frac{(4.4)(5280)}{12}\right) = 4.17$ mi

$L_a = 4.5\left(\frac{(2.2)(5280)}{12}\right) = 1.70$ mi

$S = \frac{(120-88)12}{(5.25)(5280)} = .017$

```
**********
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
**********

**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
JULY 1973
LAST MODIFICATION  25 FEB 74
RUN DATE 03JUL78 TIME 12:46:46
**********
1     A1   PATTERSON ARIXIUS SITE 1
2     A2   PHASE I
3     A3   PMF
4     B    300        0        15       0        0        0        0        0        0        0
5     J1   5
6     J    1          0        1
7     J1   .2         .4       .5       .6       .8       1
8     K    0          1                          2                 1
9     K1   INFLOW FROM MAST
10    KM   1          1        4.42
11    P                21.0     111      123      133      142
12    T                                                          1        .1
13    I    3.0        .025
14    X    -2.0       -.05     1
15    K    1          1                          2                 1
16    K1   OUTFLOW THROUGH RESERVOIR
17    Y                                          1        1
18    Y1   1                                                    -1016.0  -1
19    Y4   990        1016     1034     1038     1041.3
20    Y5                50       132      621      1750
21    S5                43       285      905      1069     1280
22    SE   988        990      1016     1034     1038     1041.3
23    S1   1016
24    S1   1041.3     2        1.5      1250
25    K    99
26    A
27    A
28    A
29    A
30    A
```

```
[illegible]                                            ********************************
[illegible]                                            NEW YORK STATE
[illegible]                                            DEPT OF ENVIRONMENTAL CONSERVATION
[illegible]                                            FLOOD PROTECTION BUREAU
[illegible]
********************************                      ********************************

[illegible] 07/31/[illegible]
        [illegible] 3   [illegible] 5 SITE 1
        PHASE I

                          JOB SPECIFICATION
   [illegible]   [illegible]   [illegible]   IDAY   IHR   IMIN   METRC   IPLT   IPRT   NSTAN
                  15                                 0       0       0      1       0
                       JOPER   NWT   LROPT   TRACE
                                       0       0

                MULTI-PLAN ANALYSES TO BE PERFORMED
                   NPLAN= 1  NRTIO= 6 LRTIO= 1
       RTIOS=   0.20   0.40   0.50   0.60   0.80   1.00

**********        **********        **********        **********        **********

                      SUB-AREA RUNOFF COMPUTATION

      INFLOW [illegible]
              ISTAQ   ICOMP   IECON   ITAPE   JPLT   JPRT   INAME   ISTAGE   IAUTO
                1       [illegible]     0       C       2      C       1        0        0

                          HYDROGRAPH DATA
      IHYDG   IUHG   TAREA   SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
         1       1    4.41      .    4.42     0.      0.        0       0       0

                          PRECIP DATA
           SPFE    PMS     R6     R12     R24     R48     R72     R96
            0.    21.30  111.[illegible]  123.00  133.[illegible]0  142.00    0.      0.
TRSPC COMPUTED BY THE PROGRAM IS 0.[illegible]

                          LOSS DATA
  LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
    0      0.      0.     1.00     0.      0.     1.00    1.00    0.10     0.      0.

                      UNIT HYDROGRAPH DATA
                  TP=  3.30   CP=0.63   NTA=  0

                        RECESSION DATA
              STRTQ=   -2.00   QRCSN=   -0.05   RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=17.03 AND R=14.40 INTERVALS

       UNIT HYDROGRAPH 36 END-OF-PERIOD ORDINATES, LAG=   3.87 HOURS, CP= 0.63  VOL= 1.00
      [illegible]     23.     55.     95.    135.    177.    222.    26[illegible].    315.    359.
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      11.     10.     1[illegible].      9.      [illegible]      [illegible]      7.      [illegible]      6.      6.
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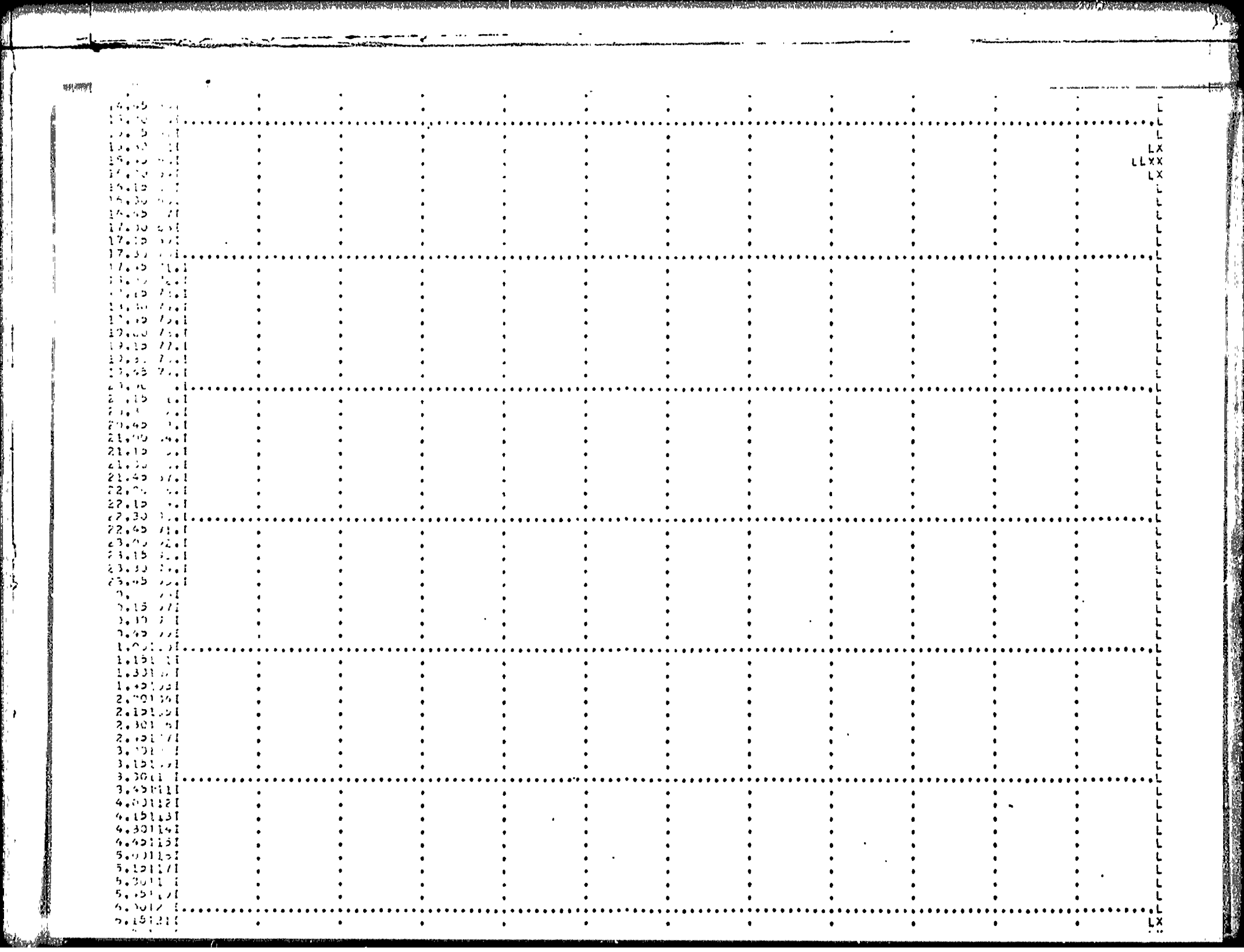
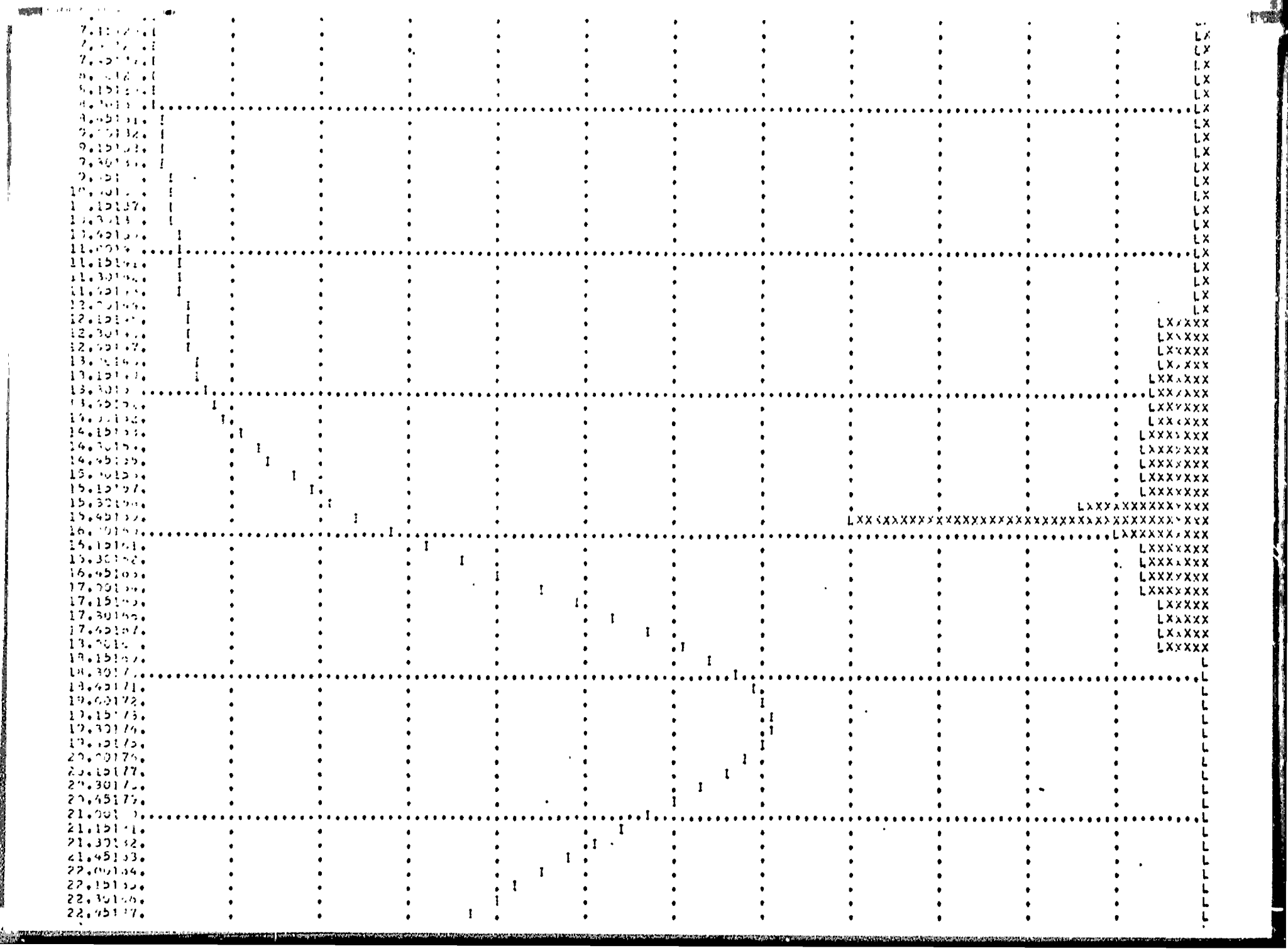
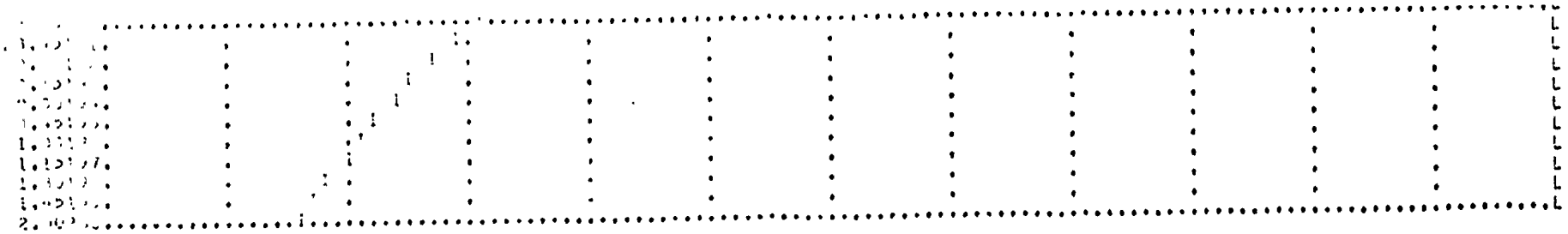
1.								22.	1.02	17.45	147	0.51	0.47	0.02	5729.
1.								27.	1.02	17.50	148	0.51	0.47	0.02	6103.
1.								31.	1.02	17.55	149	0.04	0.02	0.03	6427.
1.								42.	1.02	17.30	150	0.04	0.02	0.03	6691.
1.								51.	1.02	18.35	151	0.04	0.02	0.03	6889.
1.									1.02	18.01	152	0.04	0.02	0.03	7020.
1.									1.02	18.15	153	0.04	0.02	0.03	7082.
1.								76.	1.02	18.30	154	0.04	0.02	0.03	7070.
1.									1.02	18.45	155	0.04	0.02	0.03	6975.
1.									1.02	19.00	156	0.04	0.02	0.03	6795.
1.								96.	1.02	19.15	157	0.04	0.02	0.03	6557.
1.								1..	1.02	19.30	158	0.04	0.02	0.03	6265.
1.								1.2.	1.02	19.45	159	0.04	0.02	0.03	6116.
1.								1..	1.02	21.00	160	0.04	0.02	0.03	5725.
1.								1.2.	1.02	21.15	161	0.04	0.02	0.03	5430.
1.								1..	1.02	21.30	162	0.04	0.02	0.03	5123.
1.								7.	1.02	21.45	163	0.04	0.02	0.03	4824.
1.								12.	1.02	22.00	164	0.04	0.02	0.03	4527.
1.								9.	1.02	22.15	165	0.04	0.02	0.03	4240.
1.								5.	1.02	22.30	166	0.04	0.02	0.03	3969.
1.								4.	1.02	22.45	167	.04	0.02	0.03	3717.
1.								7.	1.02	23.00	168	0.04	0.02	0.03	3481.
1.								71.	1.02	23.15	169	0.04	0.02	0.03	3261.
1.								67.	1.02	23.30	170	0.04	0.02	0.03	3055.
1.								43.	1.02	23.45	171	0.04	0.02	0.03	2864.
1.								64.	1.03	0.	172	0.04	0.02	0.03	2685.
1.								58.	1.03	0.15	173	0.	0.	0.	2519.
1.								53.	1.03	0.30	174	0.	0.	0.	2363.
1.								50.	1.03	0.45	175	0.	0.	0.	2217.
1.								47.	1.03	1.00	176	0.	0.	0.	2080.
1.								45.	1.03	1.15	177	0.	0.	0.	1951.
1.								42.	1.03	1.30	178	0.	0.	0.	1831.
1.								40.	1.03	1.45	179	0.	0.	0.	1717.
1.								39.	1.03	2.00	180	0.	0.	0.	1610.
											SUM	23.96	20.16	3.70	203987.
												(1806.)(	512.)(	94.)(	5917.05)

	0 HR	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	70 2.	5752.	2137.	1041.	20816.
C S	2 1.	143.	61.	29.	5 95.
I C-85		12.1	17.99	1 .25	1 .25
		507.9	456.92	469.07	46 .7
C-FT		2952.	4238.	4301.	4 61.
TH S C		3518.	5228.	5305.	530 .







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[illegible] HYDROGRAPH [illegible]

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STORAGE

284.	28[illegible].	282.	[illegible]1.	2[illegible].	279.	279.	27[illegible].	277.	276.
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457.	491.	528.	571.	617.	668.	723.	782.	[illegible]44.	508.
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98[illegible].	976.	972.	9[illegible].	9[illegible].	960.	956.	[illegible]	950.	946.
944.	941.	[illegible]	93[illegible].	93[illegible].	932.	930.	[illegible]	927.	925.

STAGE

1015.9	1015.9	1015.8	1015.7	1015.7	1015.6	1015.5	1015.4	1015.4	1015.3
1015.2	1015.2	1015.1	1015.[illegible]	1015.[illegible]	1014.9	1014.9	1014.[illegible]	1014.7	1014.7
1014.6	1014.5	1014.5	1014.4	1014.3	1014.3	1014.2	1014.2	1014.1	1014.0
1014.0	1013.9	1013.9	1013.[illegible]	1013.7	1013.7	1013.6	1013.5	1013.5	1013.4
1013.4	1013.3	1013.2	1013.2	1013.1	1013.1	1013.0	1013.0	1012.9	1012.8
1012.8	1012.7	1012.7	1012.6	1012.6	1012.5	1012.5	1012.4	1012.3	1012.3
1012.2	1012.2	1012.1	1012.1	1012.0	1012.0	1011.9	1011.9	1011.9	1011.8
1011.[illegible]	1011.[illegible]	1011.[illegible]	1011.[illegible]	1011.9	1011.8	1011.8	1011.[illegible]	1011.9	1011.9
1011.9	1011.9	1011.9	1011.[illegible]	1011.9	1011.9	1011.9	1011.9	1011.9	1011.9
1011.9	1011.9	1011.9	1011.[illegible]	1011.[illegible]	1011.8	1011.8	1011.[illegible]	1011.8	1011.7
1011.7	1011.7	1011.6	1011.6	1011.6	1011.5	1011.5	1011.5	1011.5	1011.4

[illegible]	[illegible]	[illegible]	[illegible]	1013.-	1014.1	1014.4	[illegible]	1015.2	1015.7
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1033.3	1025.2	[illegible]	1025.1	1035.0
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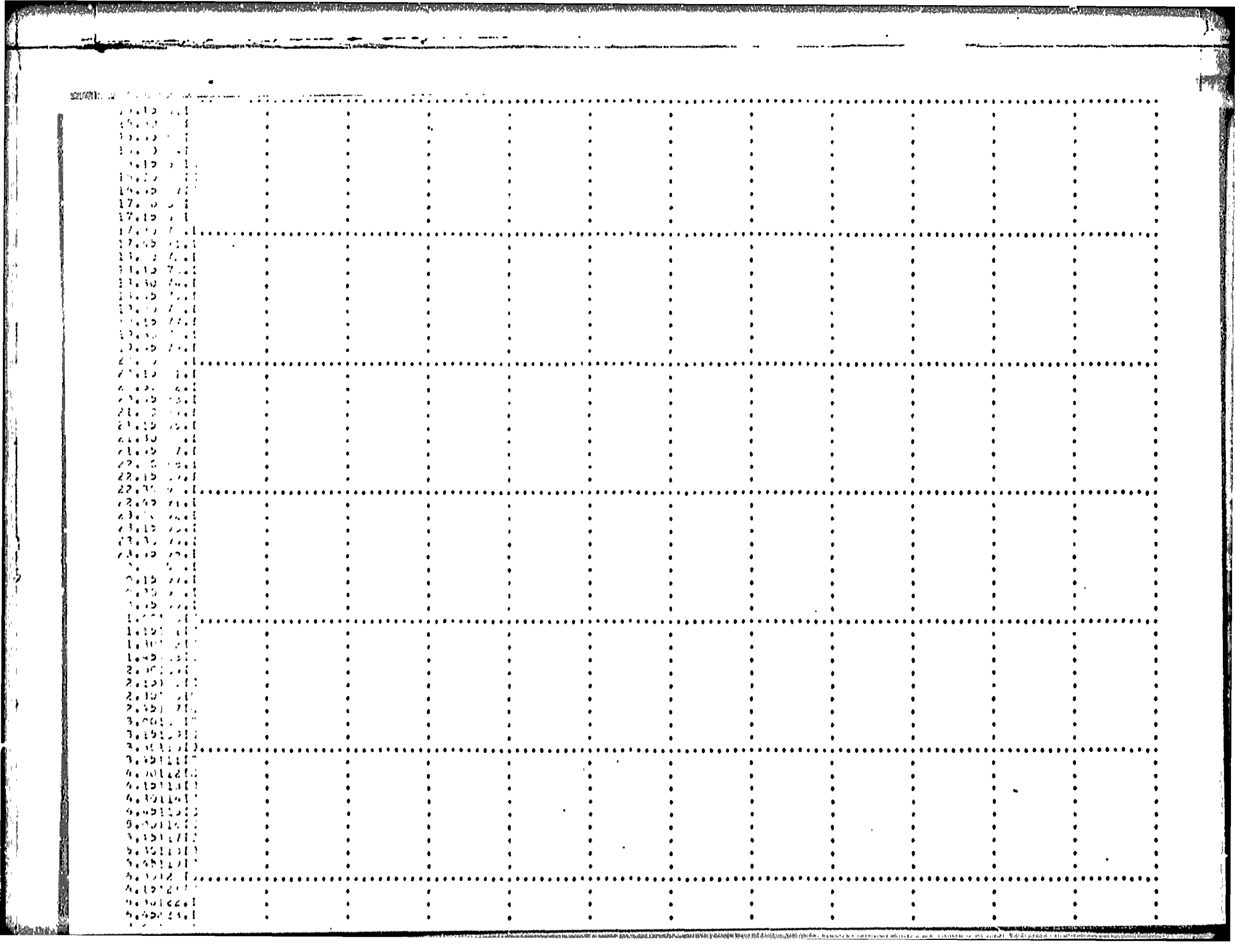

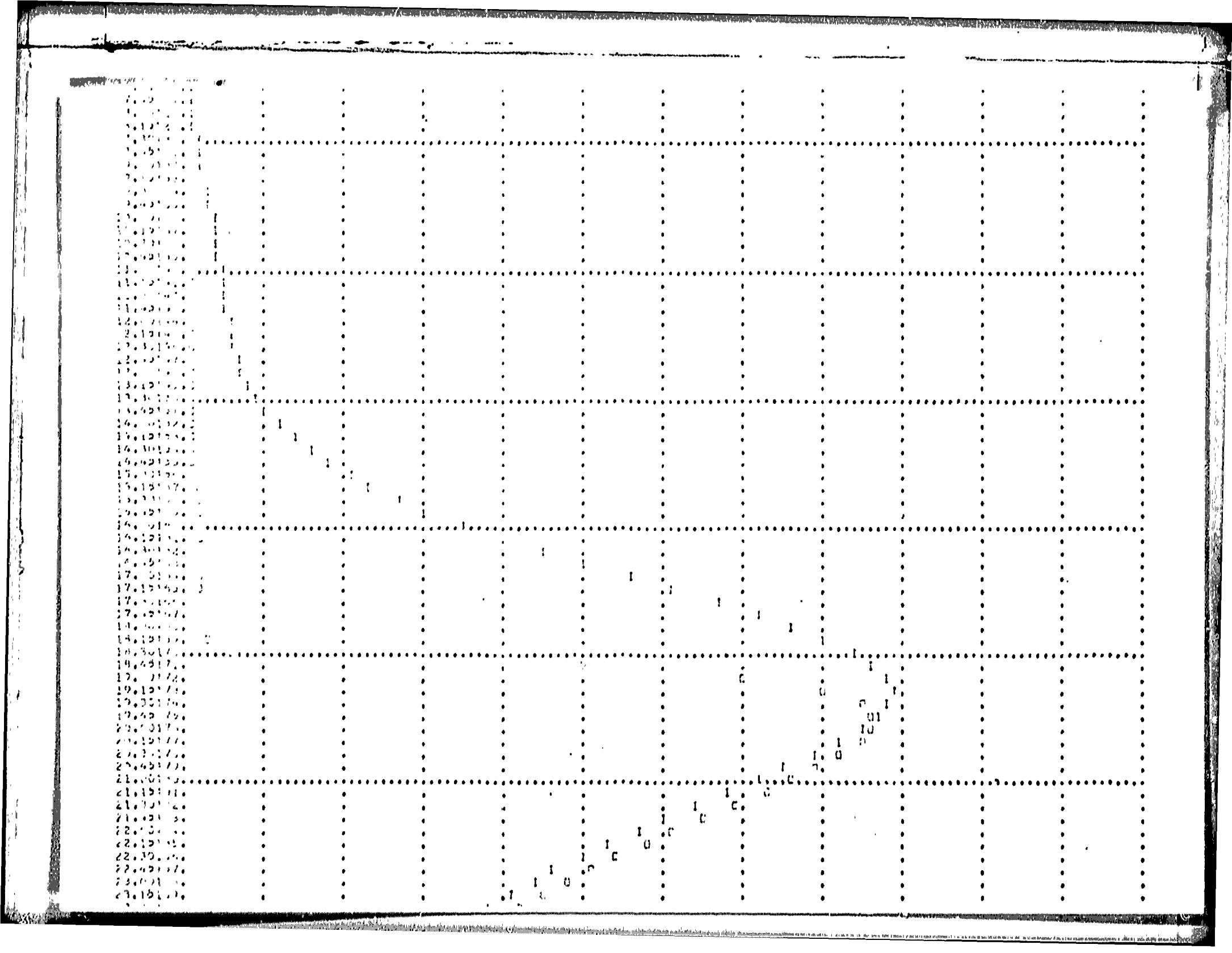

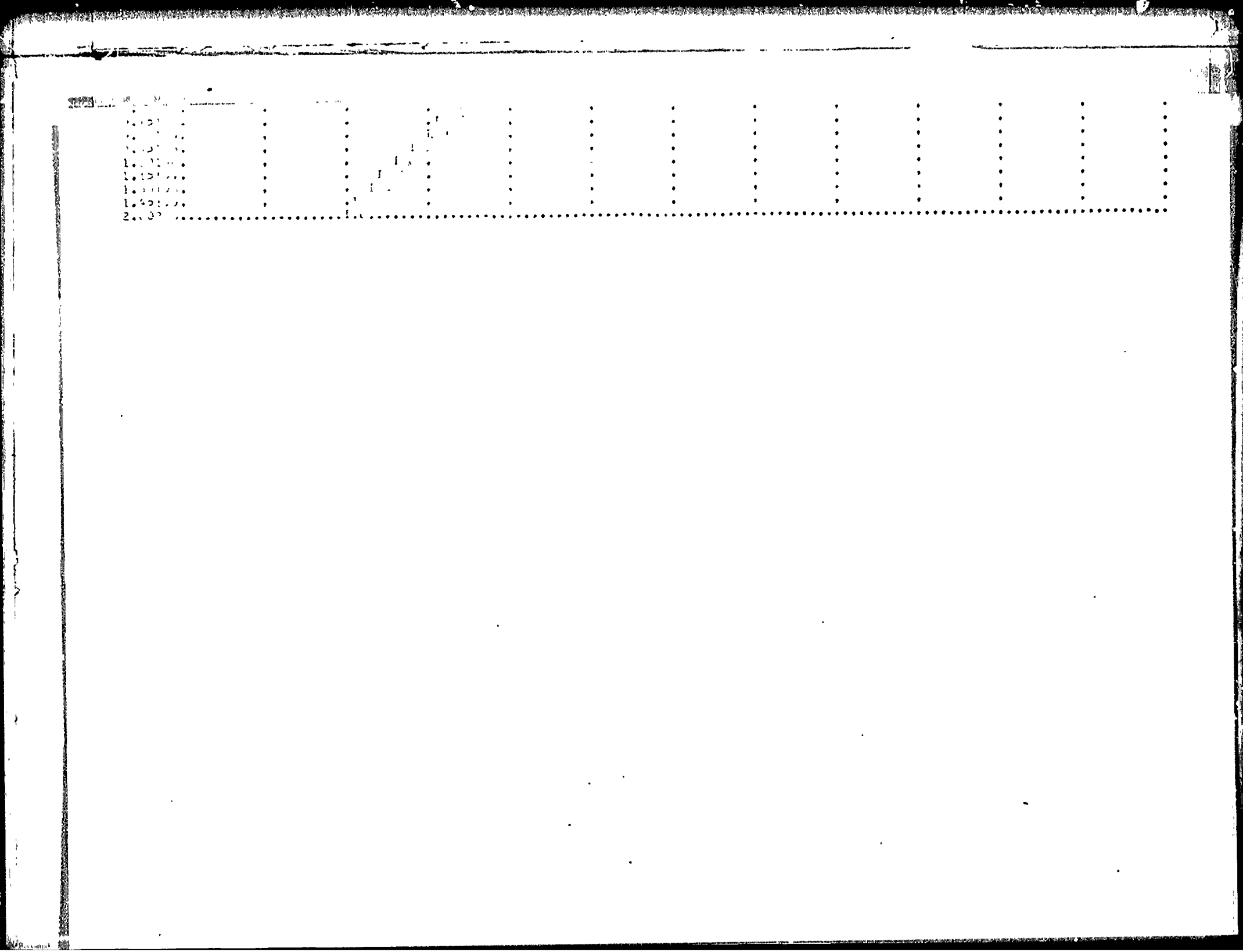

STATION 1+ PLAN 1+ ALTIT A

-STAGE FOR HYDROGRAPH INCREMENTS

TIME

37.	37.	37.	37.	37.	37.	37.	37.	37.	37.
37.	37.	37.	37.	37.	37.	37.	37.	37.	37.
45.	45.	45.	45.	45.	45.	46.	46.	46.	46.
44.	44.	44.	44.	44.	44.	44.	44.	44.	44.
42.	42.	42.	42.	42.	42.	43.	43.	42.	42.
41.	41.	41.	41.	41.	41.	41.	41.	41.	41.
40.	40.	40.	40.	40.	40.	40.	40.	40.	40.
41.	41.	41.	41.	41.	41.	41.	41.	41.	41.
43.	43.	43.	43.	43.	43.	43.	43.	43.	43.
44.	44.	44.	44.	44.	44.	44.	44.	44.	44.
43.	43.	43.	43.	43.	43.	43.	43.	43.	43.
43.	43.	43.	43.	43.	43.	43.	44.	44.	44.
44.	44.	44.	44.	47.	48.	49.	51.	52.	52.
59.	59.	59.	59.	57.	58.	59.	62.	64.	64.
81.	81.	81.	81.	77.	81.	86.	91.	97.	104.
119.	121.	131.	217.	3504.	4427.	5262.	5921.	5935.	6299.
6746.	6954.	7029.	7032.	7032.	6922.	6748.	6514.	6361.	6033.
5770.	5514.	5264.	4912.	4612.	4389.	4062.	3767.	3561.	3340.
3128.	2939.	2759.	2597.	2441.	2297.	2129.	1967.	1875.	1757.

STORAGE

274.	273.	273.	273.	273.	274.	275.	277.	277.	277.
278.	278.	278.	277.	277.	277.	277.	269.	269.	269.
262.	262.	262.	262.	262.	263.	263.	263.	262.	261.
260.	260.	259.	258.	257.	257.	256.	255.	254.	254.
253.	252.	252.	251.	251.	249.	249.	248.	247.	247.
246.	245.	245.	244.	243.	243.	242.	241.	241.	240.
239.	239.	238.	237.	237.	236.	236.	236.	235.	235.
234.	234.	238.	237.	237.	239.	240.	241.	242.	244.
246.	246.	247.	247.	248.	250.	251.	252.	252.	253.
253.	254.	254.	254.	254.	255.	255.	255.	255.	254.
254.	254.	254.	254.	254.	253.	253.	253.	253.	253.
252.	252.	252.	252.	252.	252.	251.	251.	251.	251.
250.	251.	251.	251.	251.	252.	252.	252.	254.	256.
258.	261.	264.	267.	271.	276.	281.	287.	293.	300.
307.	314.	322.	331.	339.	347.	356.	367.	378.	391.
404.	424.	442.	455.	461.	522.	557.	595.	641.	693.
759.	826.	896.	960.	997.	1021.	1037.	1052.	1062.	1071.
1077.	1081.	1084.	1085.	1084.	1082.	1079.	1076.	1070.	1064.
1057.	1050.	1042.	1034.	1025.	1015.	1011.	1004.	994.	982.
968.	951.	932.	911.	967.	963.	959.	954.	952.	949.

STAGE

1015.9	1015.9	1015.8	1015.7	1015.7	1015.6	1015.6	1015.5	1015.4	1015.4
1015.3	1015.3	1015.2	1015.1	1015.1	1015.0	1015.0	1014.9	1014.8	1014.8
1014.7	1014.7	1014.6	1014.6	1014.5	1014.4	1014.4	1014.3	1014.3	1014.2
1014.2	1014.1	1014.1	1014.0	1013.9	1013.9	1013.8	1013.8	1013.7	1013.7
1013.6	1013.6	1013.5	1013.5	1013.4	1013.4	1013.3	1013.3	1013.2	1013.2
1013.1	1013.1	1013.0	1013.0	1012.9	1012.9	1012.8	1012.8	1012.7	1012.7
1012.6	1012.6	1012.6	1012.5	1012.4	1012.4	1012.3	1012.3	1012.3	1012.3
1012.3	1012.3	1012.4	1012.4	1012.5	1012.6	1012.6	1012.7	1012.8	1012.9
1013.0	1013.1	1013.2	1013.3	1013.3	1013.4	1013.5	1013.5	1013.6	1013.6
1013.6	1013.7	1013.7	1013.7	1013.7	1013.7	1013.7	1013.7	1013.7	1013.7
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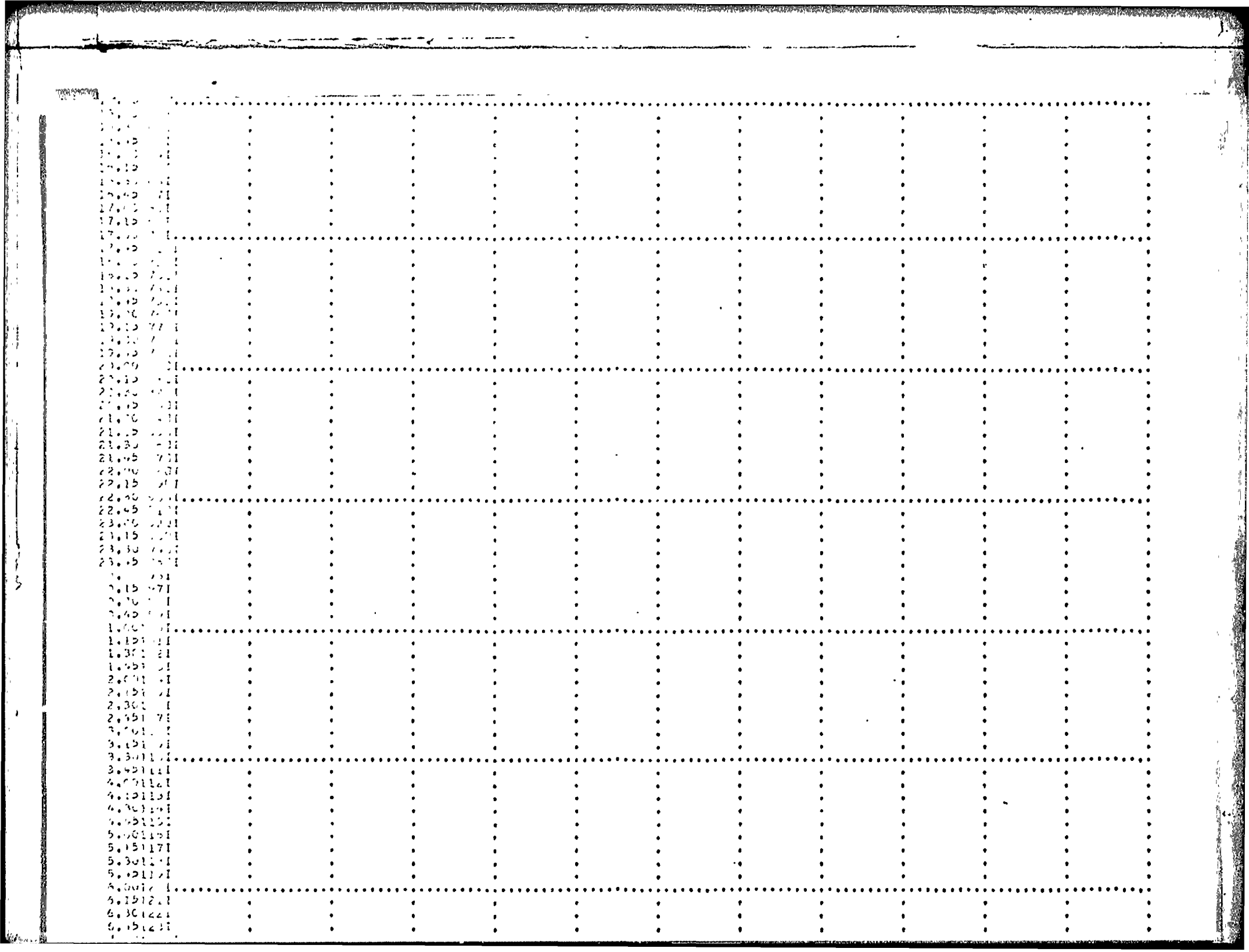
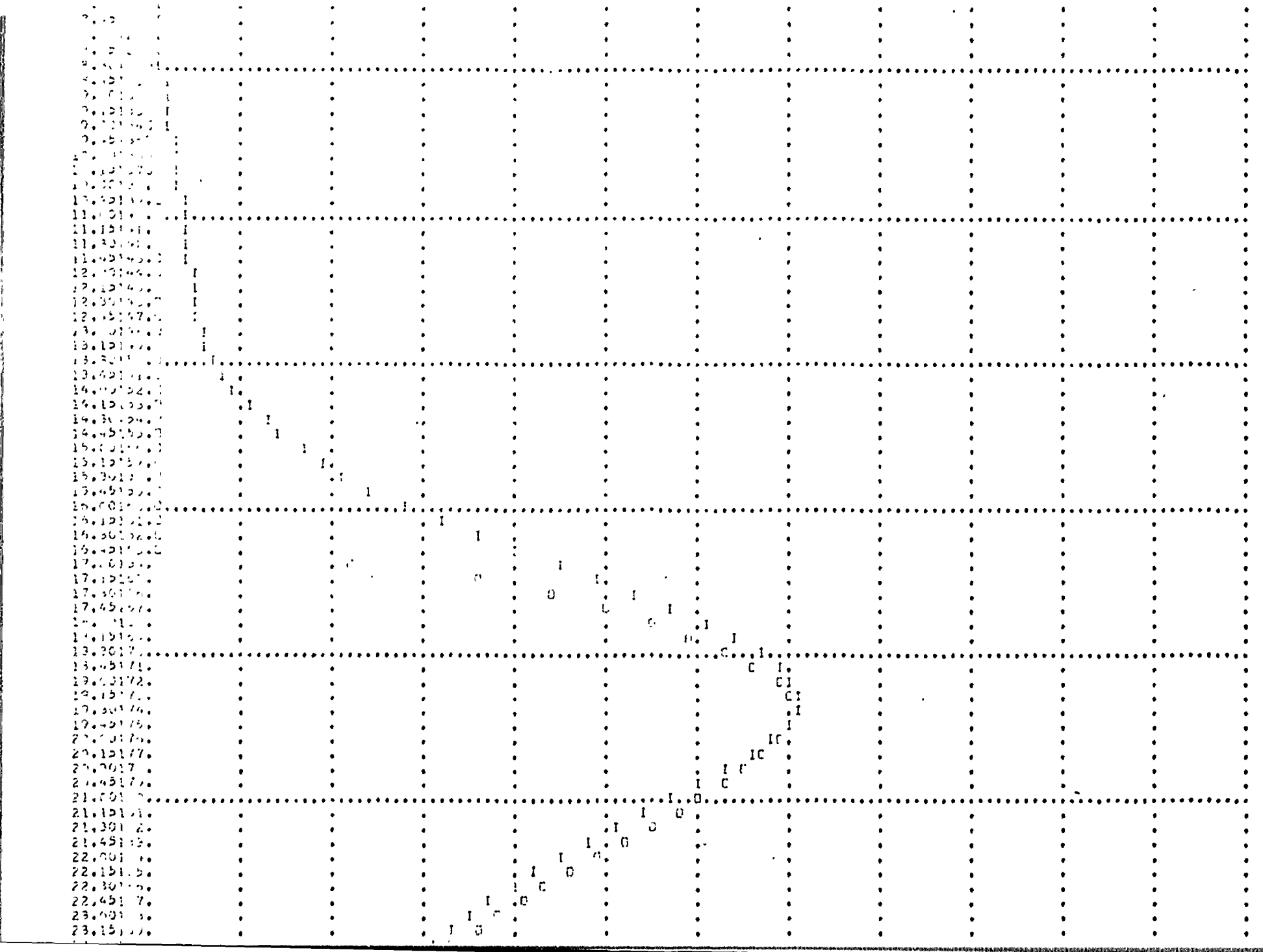
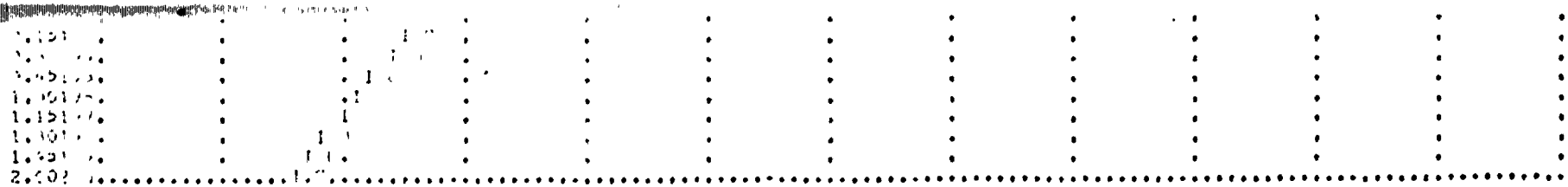






PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

EPLANATION	STATION	AREA	PLAN	RATIO 1 0.20	RATIO 2 0.40	RATIO 3 0.50	RATIO 4 0.60	RATIO 5 0.80	RATIO 6 1.00
BY SUBAREA	1	4.42	1	1410.	2833.	3541.	4249.	5665.	7082.
		(11.44)		(40.11)(	80.21)(	100.27)(	120.32)(	160.43)(	200.53)(
ROUTED TO	1	4.42	1	380.	2632.	3457.	4199.	5612.	7053.
		(11.44)		(10.76)(	74.54)(	97.90)(	118.91)(	158.92)(	199.73)(

SUMMARY OF DAM SAFETY ANALYSIS

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1016.00	1016.00	1041.30
STORAGE	215.	215.	1280.
OUTFLOW	10.	50.	17500.

RATIO OF PMF	MAXIMUM RESERVOIR WATER SURFACE ELEV FEET	MAXIMUM DEPTH OVER DAM FEET	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.00	1024.16	0.	912.	3402.	0.	43.25	0.
.25	1025.05	0.	972.	2682.	0.	44.25	0.
.50	1025.85	0.	965.	3457.	0.	43.75	0.
.75	1026.62	0.	1015.	4192.	0.	43.75	0.
1.00	1027.31	0.	1053.	5612.	0.	43.75	0.
1.25	1028.25	0.	1085.	7053.	0.	43.50	0.

APPENDIX D

REFERENCES

APPENDIX D

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) Soil Conservation Service, National Engineering Handbook, Section 4, Hydrology, August 1972 (U.S. Department of Agriculture).

3) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

4) T.W. Lambe and R.V. Whitman, Soil Mechanics, John Wiley and Sons, 1965.

5) W.D. Thornbury, Principles of Geomorphology, John Wiley and Sons, 1969.

6) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

7) Cornell University Agriculture Experiment Station (compiled by M.G. Cline and R.L. Marshall), General Soil Map of New York State and Soils of New York Landscapes, Information Bulletin 119, 1977.

APPENDIX E

STABILITY ANALYSIS

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : W. S. Atkinson, State Conservation Engineer, SCS, Syracuse, New York 13210 DATE: April 20, 1965

FROM : Rey S. Decker, Head, Soil Mechanics Laboratory, SCS, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York WP-08, Patterson Creek, Site No. 1 (Broome County)

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-355, Triaxial Shear Test Data, 1 sheet.
3. Form SCS-352, Compaction and Penetration Resistance Report, 4 sheets.
4. Form SCS-353, Grain Size Distribution Graph, 1 sheet.
5. Form SCS-357, Summary - Slope Stability Analysis, 2 sheets.
6. Investigational Plans and Profiles.

DISCUSSION

FOUNDATION

A. Classification: The foundation conditions and materials at this site are clearly outlined and well depicted in the geology report.

The abutments consist of till that is logged as a dense to very dense GM. This till contains approximately 15 percent material larger than 3 inches with numerous cobbles and flags larger than 6 inches.

The emergency spillway samples 65W2618, 65W2619 and 65W2620 are representative of the till at the surface on the abutments. Samples from the emergency spillway contain slightly less than 50 percent fines and are classed as GC.

The materials in the floodplain section consist of a dense till overlying gravels and silts of lacustrine origin. The lacustrine sediments in turn overlie a dense glacial till.

The surface till zone is about 8 feet thick. This material contains approximately 60 percent gravel and 20 percent fines. Laboratory sample 65W2617 is representative. The lacustrine gravels range from a few feet thick to 10 feet thick. Field samples indicate that these materials contain from 50 to 60 percent material passing the No. 4 sieve and from about 10 to 20 percent fines. The lacustrine silts contain approximately 90 percent fines. The till in the surface zone is classed as a GC-GM.

Gradation curves for the lacustrine materials are included in the geology report.

B. Blow Count: Blow count in the surface till zone was generally above 30 blows/foot. Tests in the surface couple feet in DH 3 and DH 4 showed blow counts of 19 and 13 blows, respectively. The material in this zone is logged as moist to wet but a water table is not indicated.

The lacustrine material below the surface till zone has blow count values ranging from 36 to more than 100 blows/foot on centerline. The ML zone in Test Hole 302 downstream from centerline had blow counts in the range of 15 to 19 blows/foot. The materials within the lacustrine zone are generally logged as wet and seepage was noted in some locations.

C. Shear Strength and Consolidation: Undisturbed samples were not submitted. The blow count data indicated a relatively strong foundation with a low consolidation potential for the loading range planned.

The fine fraction of these materials is somewhat plastic and blow count could possibly be lower if the moisture content was not near theoretical saturation at the time of test.

D. Permeability: With the exception of the GW in the bottom of the channel, the permeability of the foundation material is expected to be relatively low for each class of material. The lacustrine gravel is expected to be the most pervious material other than the stream channel gravels. The D_{10} size of the lacustrine gravel is about 0.074 mm. or less. The blow count indicates a relatively dense gravel; therefore, we estimate the permeability rate will be in the range of 1 to 5 feet per day or less, depending upon the amount of fines.

EMBANKMENT

A. Classification: The embankment material will come from the emergency spillway. Three samples were submitted from the spillway. The samples indicate that the till from the spillway is very uniform. It contains slightly less than 50 percent fines and is classed as a GC. The liquid limit is near 30 and the PI is about 12. About 15 percent of the material is larger than the 3-inch size.

B. Compacted Density: Standard Proctor compaction tests were made on the three samples submitted. The tests were made on the fraction finer than 3/4 inch in accordance with ASTM D-698T, Method C. The maximum density obtained was 125 p.c.f. for all three samples.

3 -- W. S. Atkinson -- 4/20/65
Rey S. Decker
Subj: ENG 22-5, New York WP-08, Patterson Creek, Site No. 1
(Broome County)

A standard Proctor test was made on the minus No. 4 fraction of Sample 65W2619 for correlation purposes. The density obtained was 119 p.c.f. Based on the density and the percent of the material larger than the No. 4 sieve size included in the compaction sample for the minus 3/4-inch test, computations show that the density of the minus 4 fraction within this test sample was also 119 p.c.f. This indicates that the gravel fraction did not interfere with compaction of the minus 4 fraction in the 1/30 cubic foot compaction mold.

C. Shear Strength: A triaxial shear test was made on Sample 65W2619. The test was made on the minus 3/4-inch fraction at a density of approximately 98 percent of standard Proctor. A consolidated, undrained test was made and pore pressure was measured during the test. The effective stress shear strength values obtained were $\bar{\phi}$ = 27°, $\bar{c}$ = 300 p.s.f. and the total stress shear values obtained were ϕ = 19°, c = 325 p.s.f.

The test values are considered representative of the borrow materials for a placement density of 98 percent of standard Proctor and are suggested for design.

SLOPE STABILITY

Slope stability was checked with a modified Swedish circle method of analysis. The analysis was made on the maximum embankment section and the trial failure arcs were limited to the embankment only.

A phreatic line was assumed from emergency spillway elevation to a drain at c/b = 0.6.

The analysis shows that the proposed 2 1/2:1 downstream slope with a drain has a factor of safety of 1.58.

A 3:1 upstream slope with a 10-foot berm at elevation 995 has a factor of safety of 1.36 with complete rapid drawdown considered. The addition of a 15-foot berm at elevation 1006 plus the 10-foot berm at elevation 995 results in a factor of safety of 1.48, which is very near the suggested minimum of 1.50 when effective stress shear parameters are used in the analysis.

SETTLEMENT ANALYSIS

The consolidation potential is expected to be low. The foundation conditions appear to be uniform and differential settlement is not expected to be a problem. The channel banks are near vertical in some places, however, and some differential might occur in this area.

SCS-355 (Rev. 4/59)

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOIL MECHANICS LABORATORY

Sample Number 65W2619

TRIAXIAL SHEAR TEST DATA

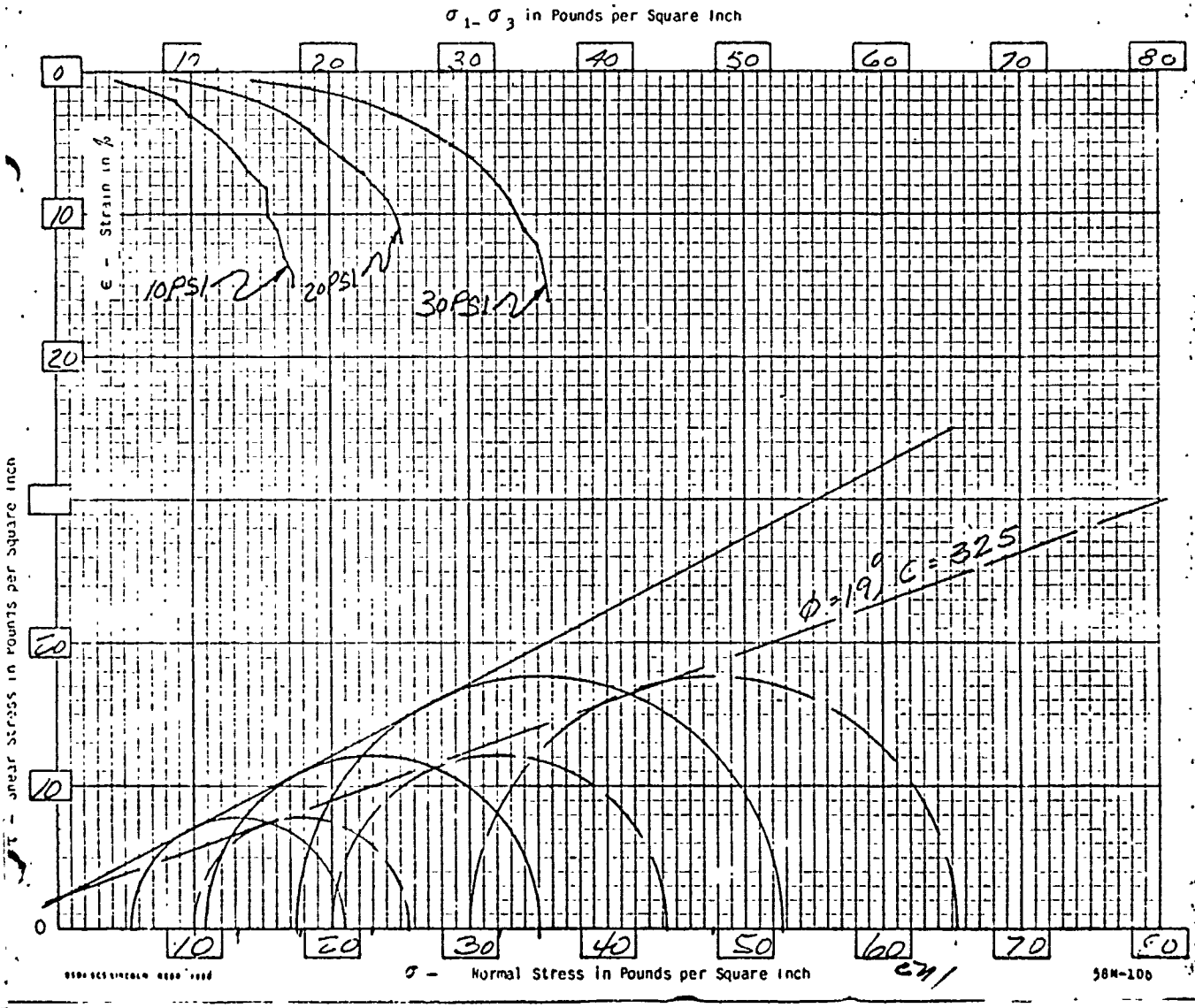
Project Patterson Creek #1 Location New York

Moisture-Density Data
Standard ☒ Max. 125.0 pcf
Modified ☐ Method C
Curve No. 2 of 3 Optimum Moisture 11.5 %
L.L. 31 P.I. 12 Class ___ G_s 2.74
% Finer Than: 0.002mm 18 0.005mm 26 #200 ___
Other Factors Affecting Shear:
% Dispersion ___ % Salt ___
Other: ___

Specifications:
Specimen: Max. < 3/4" Height ___ Size ___ Diameter 4.0" Material
☒ Consolidated ☐ Drained
☐ Unconsolidated ☒ Undrained
Pore Pressure Measured
☐ Undisturbed and Tested at: ☐ Natural Moisture ☐ Saturation
☒ Remolded and Tested at: 98 % of ☑ Standard ☐ Modified
with w = ___ % which is
☐ Lower than Optimum ☐ Optimum ☐ Higher than Optimum ☐ Saturated

Test Data

Dry Density γ pcf	% Max. Dry Den.	Moisture Content: Start %	% Sat. Start	Moisture Content: End %	Lateral Pressure σ_3 / σ_3	Consolidation Data: Orig. e_0	Consolidation Data: Final e_f	Stress at Failure $\sigma_1 - \sigma_3$	% Strain at Failure ε	Internal Friction φ Tan φ	Unit Cohesion C
123.0	98.5	14.1	98.6	13.3	10	.391	.370	15.5	8.2	φ = 27°	2.0 psi
123.0	98.5	14.5	100.0	13.2	20	.391	.363	24.5	9.0		
122.4	98.0	14.4	99.3	12.4	30	.398	.393	35.3	13.1	Tan φ	300 psf



58M-108

4 -- W. S. Atkinson -- 4/20/65
Roy S. Decker
Subj: ENG 22-5, New York WP-08, Patterson Creek, Site No. 1
(Broome County)

RECOMMENDATIONS

A. Site Preparation: Normal site preparation should be adequate to remove any loose materials at the surface.

We recommend that the channel banks be flattened to insure a good bond between the backfill and the foundation and to reduce the possibility of critical differential settlement in this area.

B. Cutoff: The Geologist suggested a shallow cutoff trench. We concur with this suggestion. A minimum trench depth of about 5 feet is suggested to insure that the trench bottoms below the zone affected by roots, rodents, cracking, etc.

The trench backfill may consist of GC material from the emergency spillway. The backfill should be compacted to a minimum of 98 percent of standard Proctor density.

C. Principal Spillway: The proposed principal spillway location is at ℄ Station 8+00. The foundation material at this location consists of till upstream from centerline. Downstream from centerline the foundation contains about a 4-foot zone of lacustrine silt and sand between layers or zones of till. The blow count within the lacustrine silt ranges from 15 to 19 blows per foot and blow count below the surface foot or two in the till is in excess of 30 blows per foot.

The conduit will be bedded in dense till and dense lacustrine silts. The consolidation potential is expected to be low and no unusual problems are anticipated.

Based on blow count, permeability is expected to be low. If zones or stratum of pervious materials are encountered in the lacustrine materials, it might be desirable to encompass the conduit with a filter drain.

The Geologist points out that the material at grade is erodible.

D. Drain: A drain is recommended to control the phreatic line in the embankment and to provide a safe outlet for underseepage. A trench drain with a pipe outlet is suggested. We concur with the trench depths suggested in the geologic report. At these depths the trench will bottom in the most pervious zones. The trench depths suggested are as follows:

5 -- W. S. Atkinson -- 4/20/65
Rey S. Decker
Subj: ENG 22-5, New York WP-08, Patterson Creek, Site No. 1
(Broome County)

T.P.	Suggested Trench Depth	Material at the Trench Bottom Logged As
508	6 feet	Till
503	5 feet	Till
302	12 feet	SM with gravel streaks
502	14 feet	SM with gravel streaks
501	14 feet	SM with gravel streaks
504	12 feet	SM
509	8 feet	GM-GW

The suggested filter limits are shown on the attached Form SCS-353. The suggested limits are such that ASTM No. 78 road gravel may be used.

E. Embankment Design:

1. Placement of Material. The borrow materials consist of a uniform glacial till from the emergency spillway; therefore, a homogeneous embankment is recommended. The borrow material should be placed at a minimum of 98 percent of standard Proctor density with the control based on the minus 3/4-inch fraction. The placement moisture content should be slightly wet of optimum.

2. Slopes. The proposed 2 1/2:1 downstream slope has an acceptable factor of safety and is recommended. The proposed 3:1 upstream slope with a 10-foot berm at elevation 995 requires modification to obtain an acceptable factor of safety. The stability analysis shows that the addition of another berm 15 feet wide at elevation 1006 results in a factor of safety of 1.48. This addition or a comparable modification is recommended.

3. Settlement. An overfill allowance of 1.5 feet is suggested to compensate for residual consolidation within the fill and foundation.

Prepared by:

Lorn P Dunnigan
Lorn P. Dunnigan

Attachments

Reviewed and Approved by:

R. B. Phillips
Roland B. Phillips

cc: B. S. Ellis, Syracuse, N. Y.
Henry W. Davis, Penn Yan, N. Y.
R. J. McClimans, Binghamton, N.Y.
H. M. Kautz, Upper Darby, Pa.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOIL MECHANICS LABORATORY

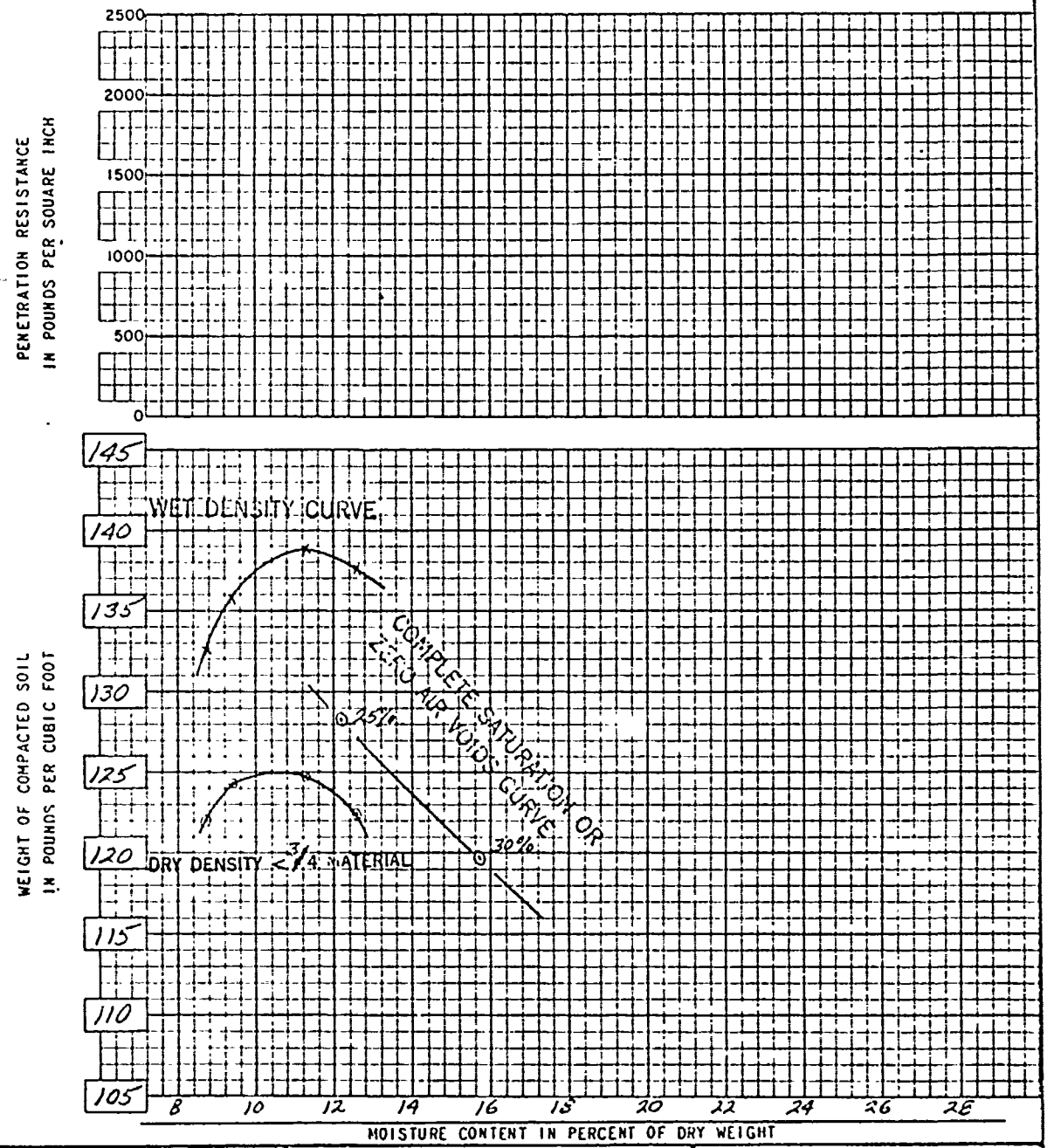
SCS-352 Rev. (10/58)

COMPACTION AND PENETRATION RESISTANCE REPORT

Date _____ Sample No.: Field 208.1 Lab 65W2618

Project Patterson Creek #1 Location New York

Sample Location and Depth Emergency Spillway 2.0'-12.0'



TYPE OF TEST	TEST PROCEDURE	Classification
☒ Standard Proctor	Weight of Hammer 5.5 Lbs.	Material compacted represents 73 percent of the sample and passed 3/4" sieve
☐ Modified AASHO	Drop 12 Inches	(Sp. Gr.) Gs= 2.74
☐ Other _____	Lifts 3	Curve 1 of 3
ASTM D698-58T Method C	Vol. of Cylinder 1/30 Cu.Ft.	

58M-26

SCS-352 Rev. (10/58)

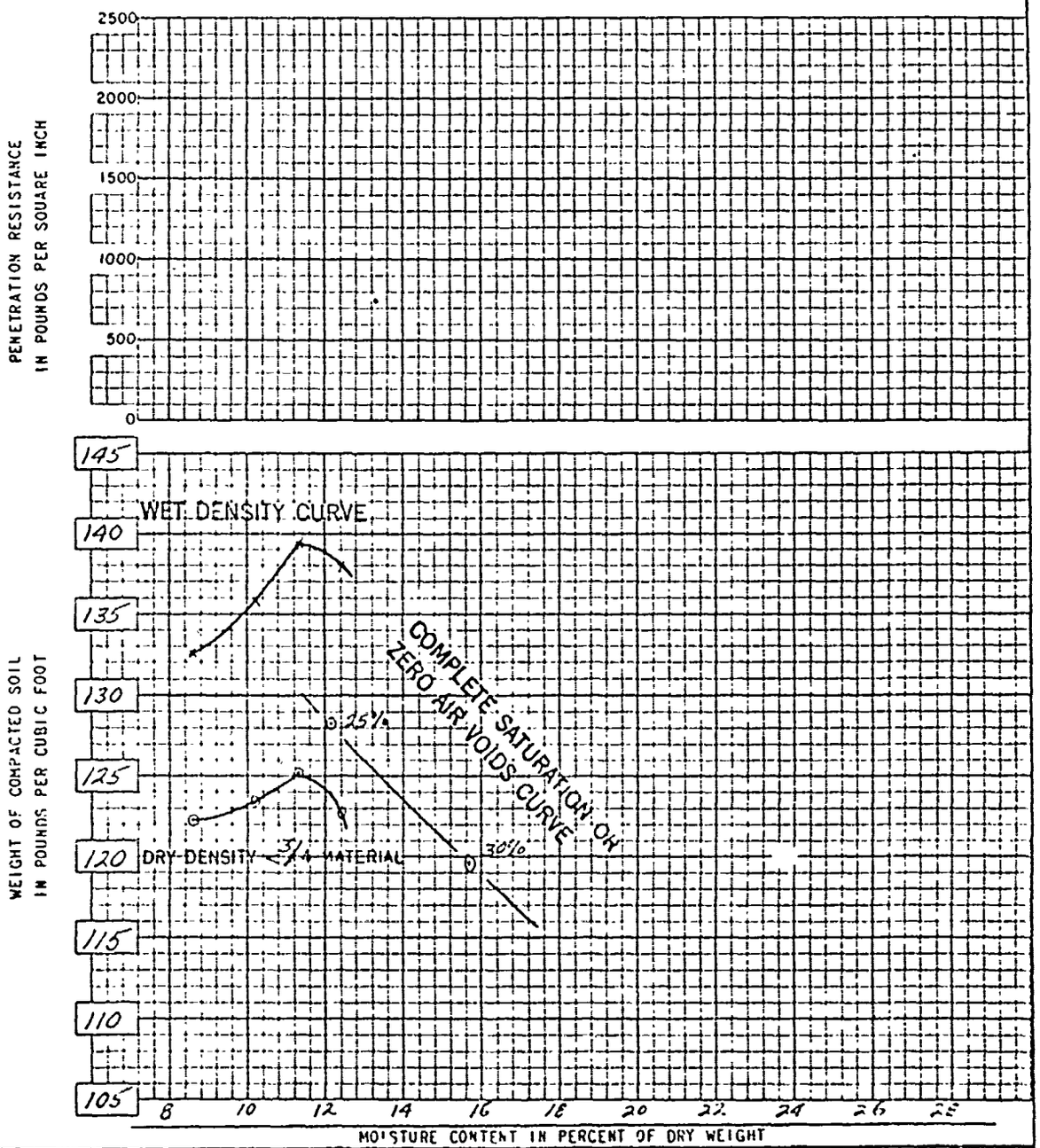
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOIL MECHANICS LABORATORY

COMPACTION AND PENETRATION RESISTANCE REPORT

Date _____ Sample No.: Field 209.1 Lab 65W2619

Project Patterson Creek #1 Location New York

Sample Location and Depth Emergency Spillway 2.0'-12.0'



TYPE OF TEST	TEST PROCEDURE	Classification
☒ Standard Proctor	Weight of Hammer 5.5 Lbs.	Material compacted represents
☐ Modified AASHO	Drop 12 Inches	75 percent of the sample
☐ Other _____	Lifts 3	and passed 3/4" sieve
	Vol. of Cylinder 1/30 Cu.Ft.	(Sp. Gr.) Gs= 2.74
ASTM D698-58T Method C		Curve 2 of 3

58M-26

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOIL MECHANICS LABORATORY

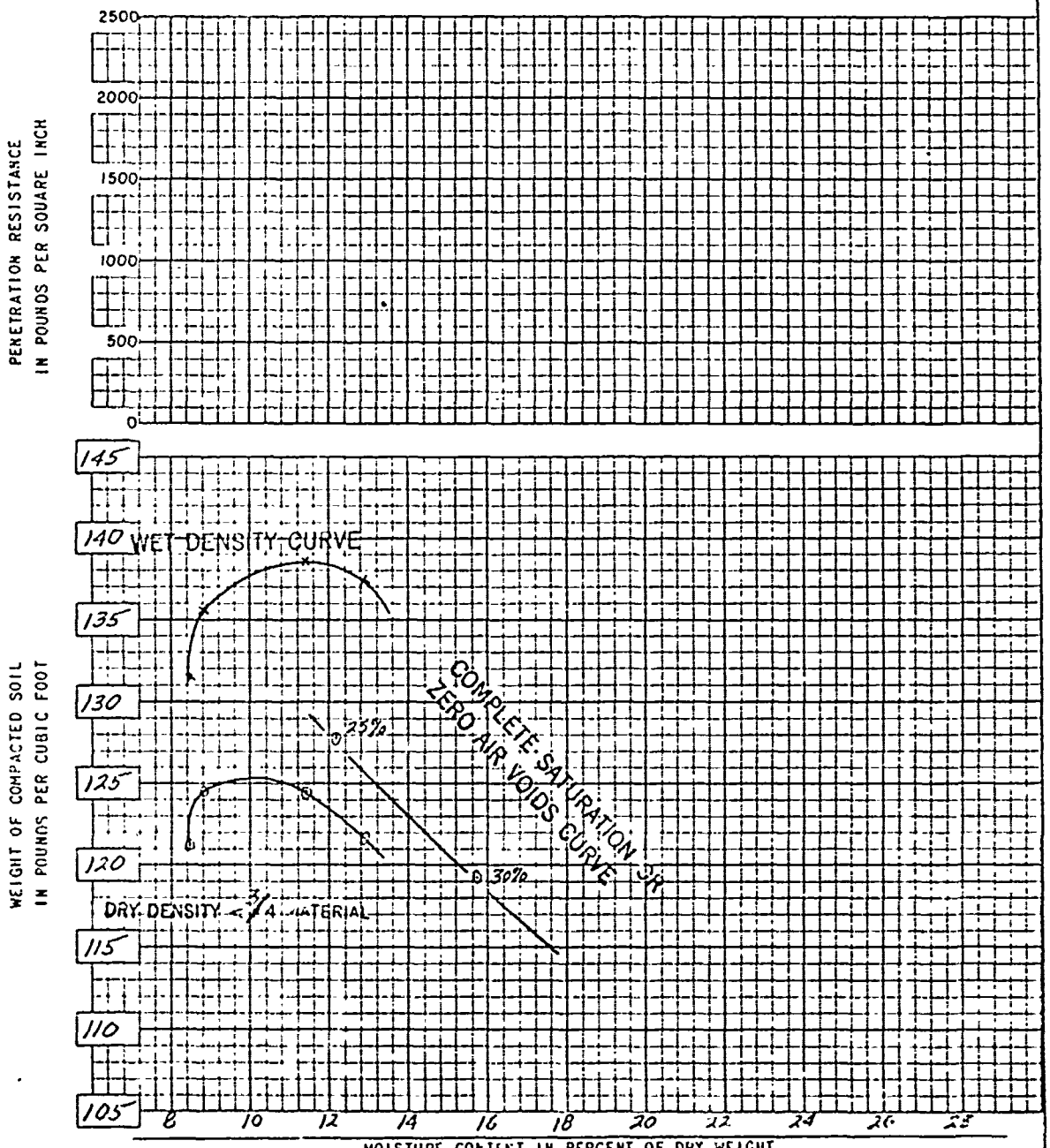
SCS-352 Rev. (10/58)

COMPACTION AND PENETRATION RESISTANCE REPORT

Date _____ Sample No.: Field 210.1 Lab 65W2620

Project Patterson Creek #1 Location New York

Sample Location and Depth Emergency Spillway 2.0-12.0'



TYPE OF TEST	TEST PROCEDURE	Classification
☒ Standard Proctor	Weight of Hammer 5.5 Lbs.	Material compacted represents 74 percent of the sample and passed 3/4 sieve
☐ Modified AASHO	Drop 12 Inches	
☐ Other _____	Lifts 3	(Sp. Gr.) Gs= 2.73
ASTM D698-58T Method C	Vol. of Cylinder 1/30 Cu.Ft.	Curve 3 of 3

58M-26

SCS-352 Rev. (10/58)

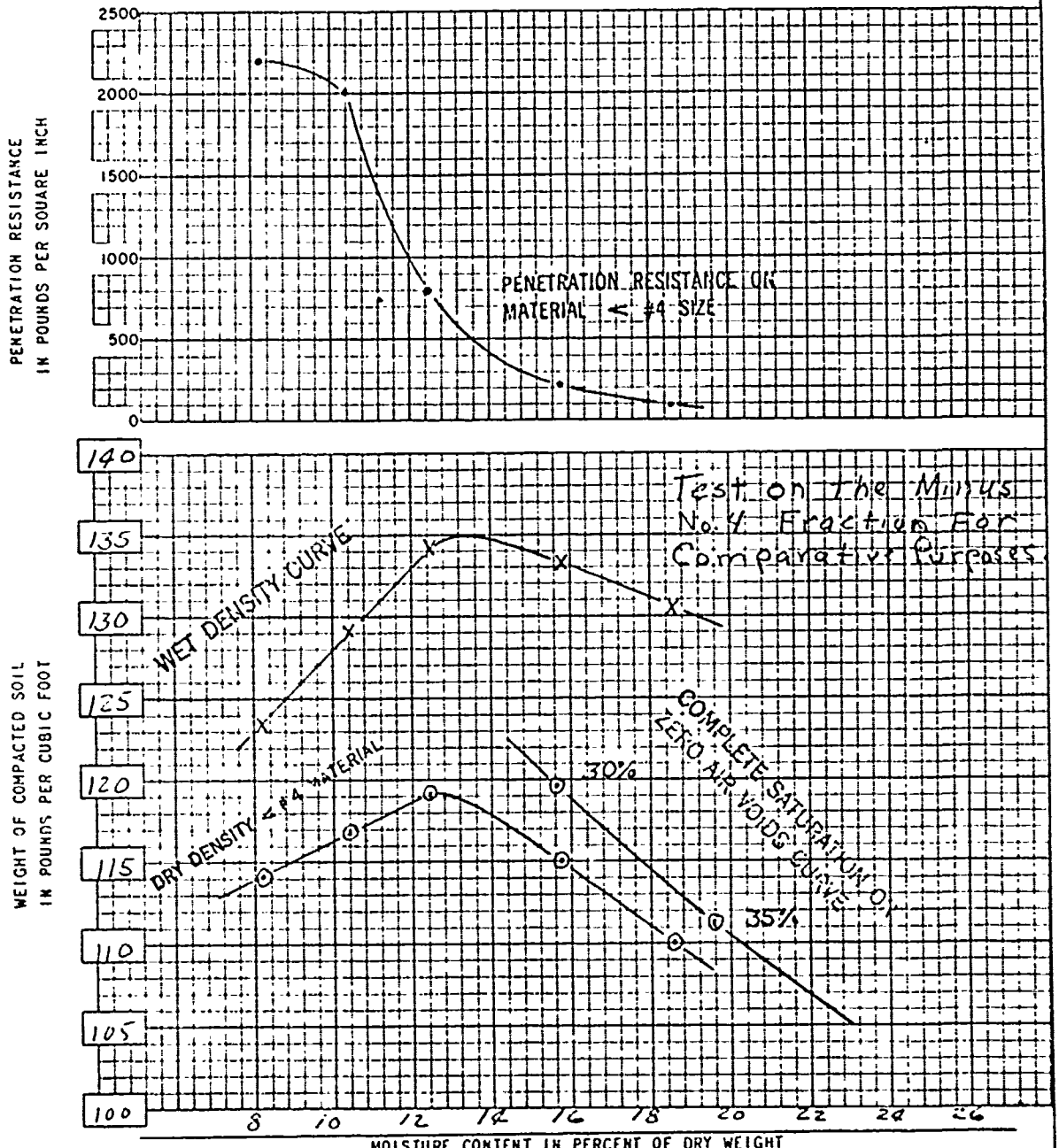
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOIL MECHANICS LABORATORY

COMPACTION AND PENETRATION RESISTANCE REPORT

Date _____ Sample No.: Field 209.1 Lab 65W2619

Project Patterson Creek No. 1 Location New York

Sample Location and Depth Emergency Spillway 20'-12.0'



TYPE OF TEST	TEST PROCEDURE	Classification
☒ Standard Proctor	Weight of Hammer 5.5 Lbs.	Material compacted represents 75 percent of the sample and passed #4 sieve
☐ Modified AASHO	Drop 12 Inches	(Sp. Gr.) Gs= 2.74
☐ Other _____	Lifts 3	Curve of
	Vol. of Cylinder 1/30 Cu.Ft.	

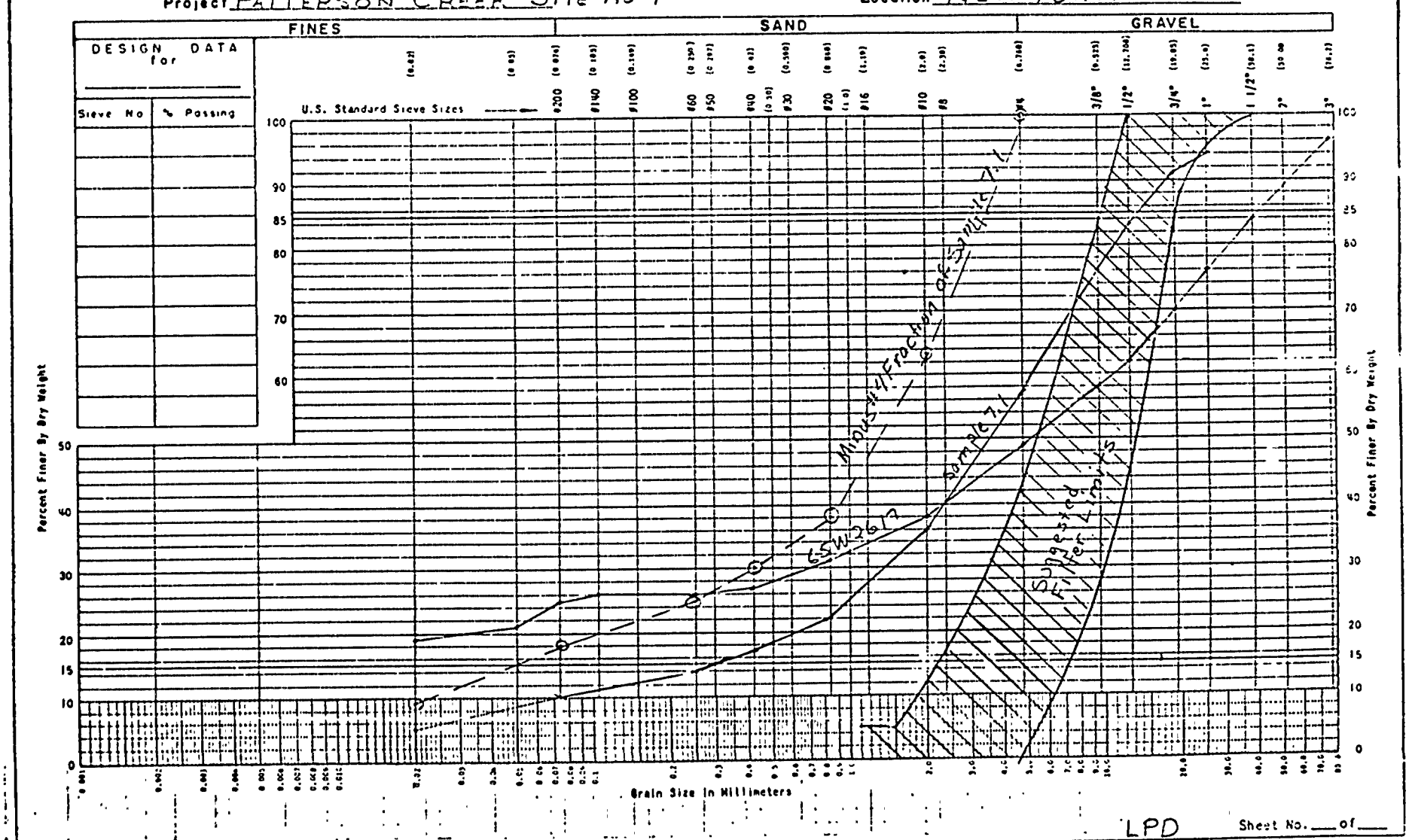
58M-26

Form SCS- 353

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

GRAIN SIZE DISTRIBUTION GRAPH

Project PATTERSON CREEK SITE No 1 Location NEW YORK



LPD

Sheet No. ___ of ___

FORM SCS-357
10-58

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SOIL MECHANICS LABORATORY

Sheet 1 of 2
Maximum Section

SUMMARY - SLOPE STABILITY ANALYSIS

State New York Project Patterson Creek Site #1

Date 9-13-65 Analysis Made By S.A.G. & A.W.L. Checked By A.W.L.

Method of Analysis Swedish Circle

Location of Material							Emb 99% Std GC			
Sample No.							65W2612			
γ_d							122.8			
γ_m							137.0			
γ_s							140.5			
γ_b							79.0			
Condition	Opt.	Sat.	Opt.	Sat.	Opt.	Sat.	Opt.	Sat.	Opt.	Sat.
ϕ								27.0°		
Tan ϕ							CU	2.510		
K										
C								300		

UPSTREAM SLOPE

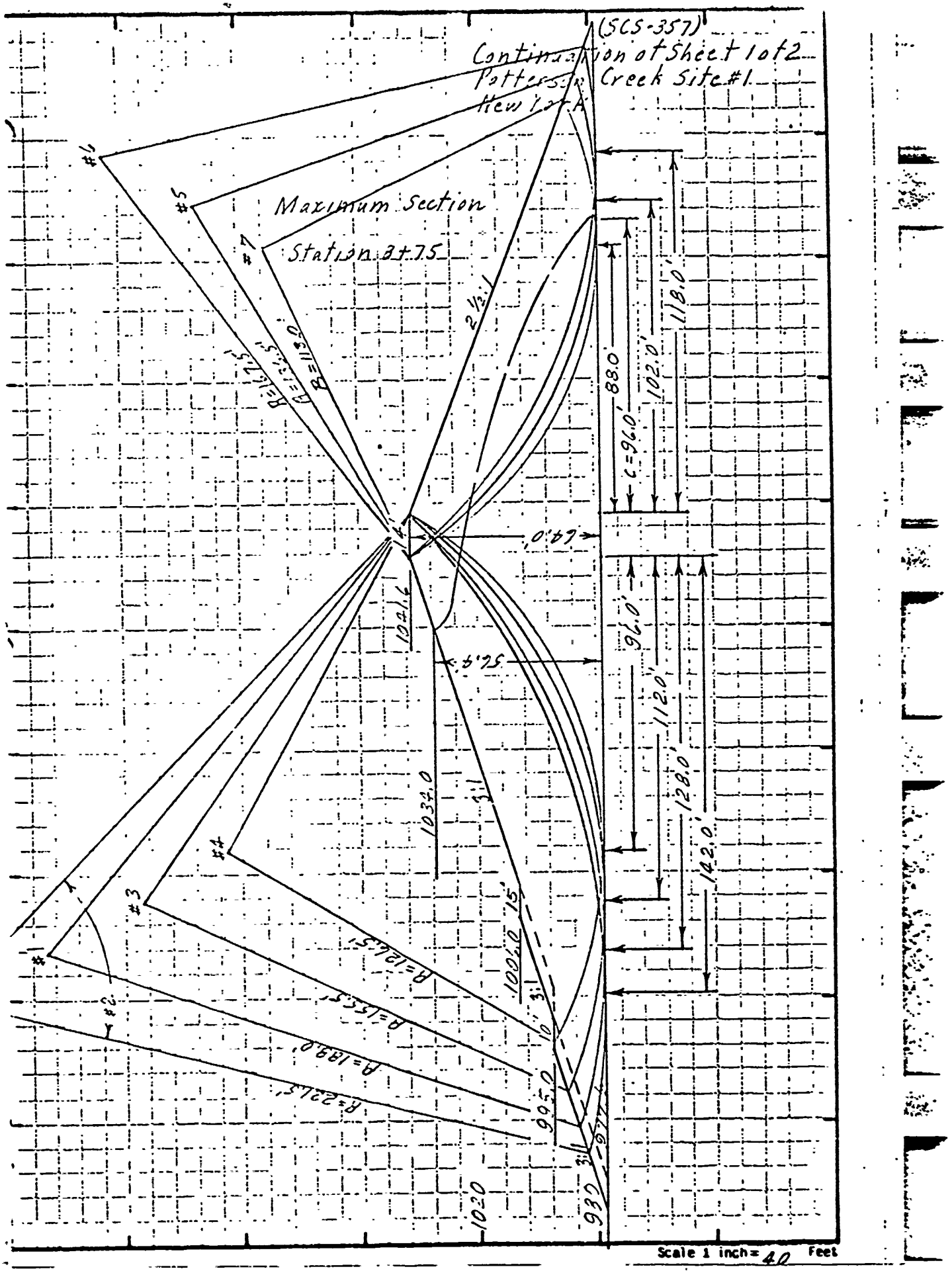
Trial	Slope	Conditions	Fs
1	3:1	Full drawdown - 10' berm @ el. 995 - Arc cut from upstream slope thru Emb (270-300) only	1.36
1A	3:1	Same as #1 except 15' berm @ el. 1005 & 10' berm @ el. 995.0	1.49
2	3:1	Full drawdown - 15' berm @ el. 1005 & 10' berm @ el. 995 - Arc cut from upstream slope thru Emb (270-300) only	1.56
3	3:1	Full drawdown - No berms @ el. 1005 & 10' berm @ el. 995 Arc cut from upstream slope thru Emb (270-300) only	1.45
4	3:1	Full drawdown from el. 1005 & 10' berm @ el. 995 Arc cut from upstream slope thru Emb (270-300) only	1.42

DOWNSTREAM SLOPE

Trial	Slope	Conditions	Fs
5	2½:1	Drain @ % = 0.6 - No berm - Arc cut from downstream slope thru Emb (270-300) only	1.52
6	2½:1	Drain @ % = 0.6 - No berm - Arc cut from downstream slope thru Emb (270-300) only	1.62
7	2:1	Drain @ % = 0.6 - No berm - Arc cut from downstream slope thru embankment (270-300) only.	1.40
		Note - Sat. shear values only.	

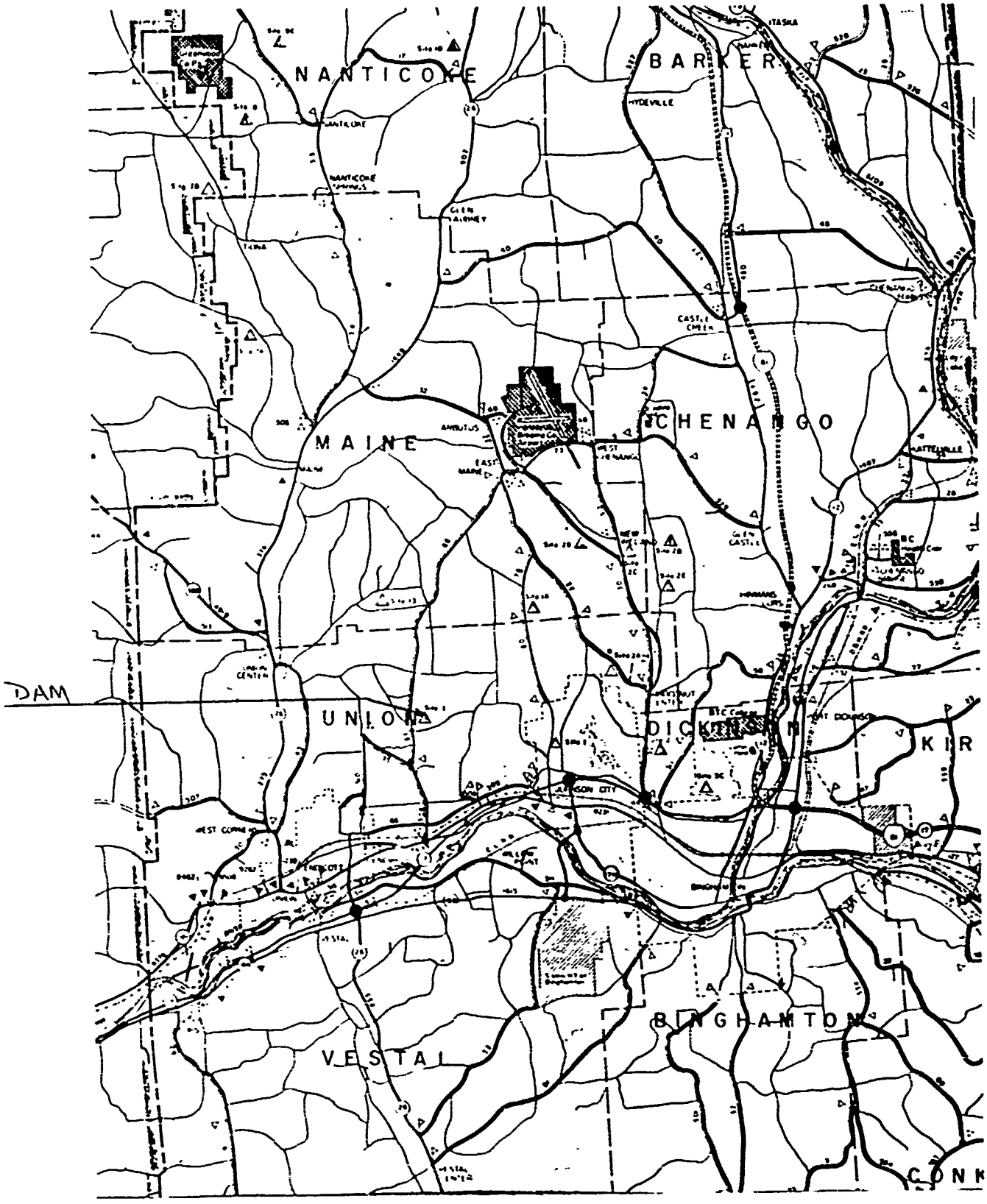
To be used to report to field offices data used for slope stability analyses and the results of the analyses. The right side of the form will be used for a sketch of the embankment on which the analyses have been made.

GPO: 1969 O - 669366

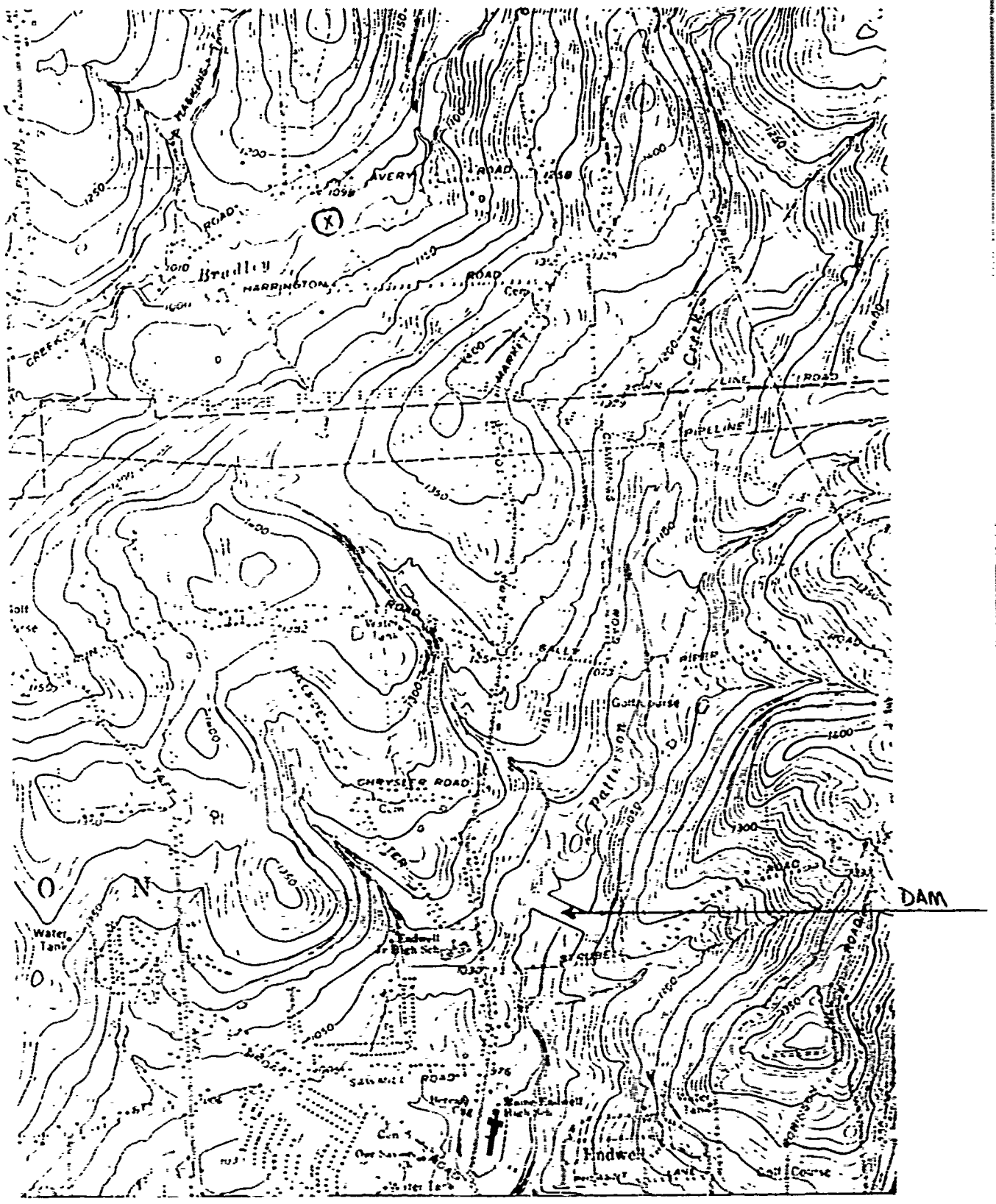

(SCS-357)
Continuation of Sheet 1 of 2
Patterson Creek Site #1
New Jersey
Maximum Section
Station 2+75
#1
#2
#3
#4
#5
#7
R=175.5'
R=111.5'
2½:1
3:1
88.0'
96.0'
102.0'
118.0'
64.0'
75.0'
90.0'
112.0'
128.0'
142.0'
1032.0
1021.6
1000.0
995.0
990.0
1020
R=125.5'
R=155.5'
R=188.0'
R=221.5'
Scale 1 inch = 40 Feet

APPENDIX F

DRAWINGS



VICINITY MAP



TOPOGRAPHIC MAP

PATTERSON BRIXIUS & GREY CREEK WATERSHED PROJECT

FLOODWATER RETARDING DAM NO. 1

DRAINAGE AREA	2829	ACRES
TOTAL STORAGE TO EMERGENCY SPILLWAY CREST -	905	ACRE FT.
WATER SURFACE AREA AT SEDIMENT POOL	7.6	ACRES
HEIGHT OF DAM	65	FEET
VOLUME OF FILL	323,500	CUBIC YARDS

BUILT UNDER THE WATERSHED PROTECTION AND FLOOD PREVENTION ACT

BY

COUNTY OF BROOME

WITH THE ASSISTANCE OF THE

SOIL CONSERVATION SERVICE

OF THE

U. S. DEPARTMENT OF AGRICULTURE

1965

INDEX

SHEET 1 - COVER SHEET
SHEET 2 - PLAN OF STORAGE AREA
SHEET 3 - PLAN OF DAMSITE
SHEET 4 - PROFILE ALONG ℄ OF DAM
SHEET 5 - PROFILES
SHEET 6 - DRAINAGE DETAILS
SHEET 7 - DRAINAGE DETAILS
SHEET 8 - PLAN - PROFILE OF PRINCIPAL SPILLWAY
SHEET 9 - RISER - STRUCTURAL DETAILS
SHEET 10 - RISER - REINF STEEL DETAILS
SHEET 11 - CRADLE, ANTI-SEEP COLLARS AND STEEL
SHEET 12 - POND DRAIN INLET DETAILS
SHEET 13 - IMPACT BASIN
SHEET 14 - TRASH RACKS, AND MISC. DETAILS
SHEET 15 - LOGS OF TEST HOLES
SHEET 16 - LOGS OF TEST HOLES

GREY CREEK
ROJECT
DAM NO. I

2829 ACRES
905 ACRE FT.

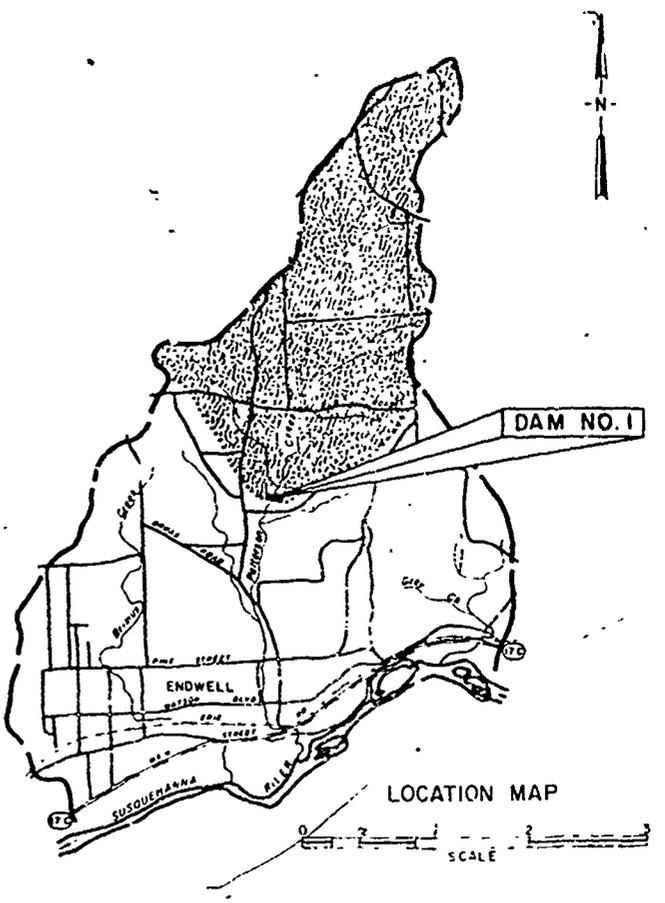
7.6 ACRES

65 FEET
3,500 CUBIC YARDS

ROTECTION AND
ACT

ME
F THE
RVICE

CULTURE



9 - RISER - STRUCTURAL DETAILS
10 - RISER - REINF. STEEL DETAILS
11 - CRADLE, ANTI-SEEP COLLARS AND STEEL DETAILS
12 - POND DRAIN INLET DETAILS
13 - IMPACT BASIN
14 - TRASH RACKS, AND MISC DETAILS
15 - LOGS OF TEST HOLES
16 - LOGS OF TEST HOLES

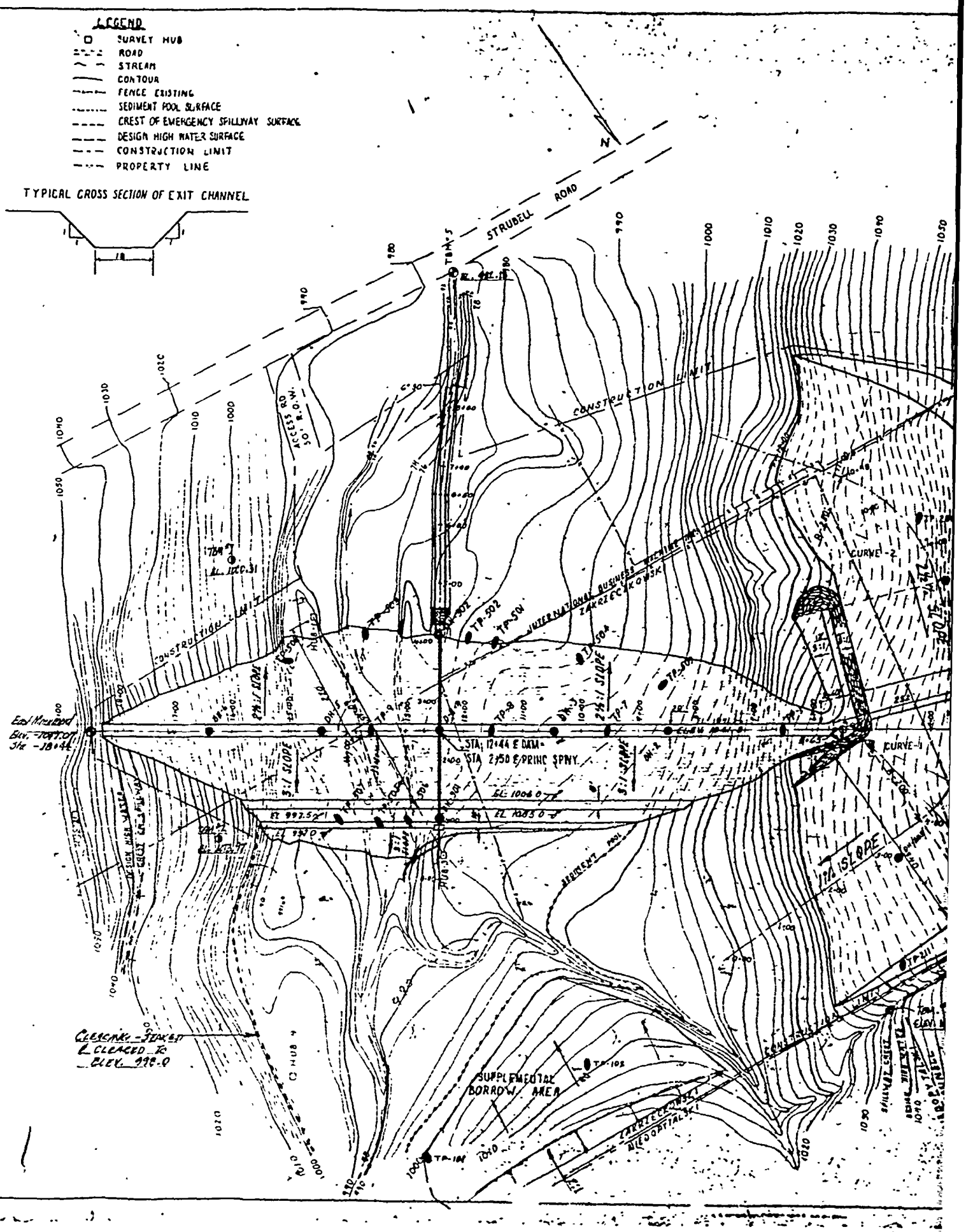
AS BUILT

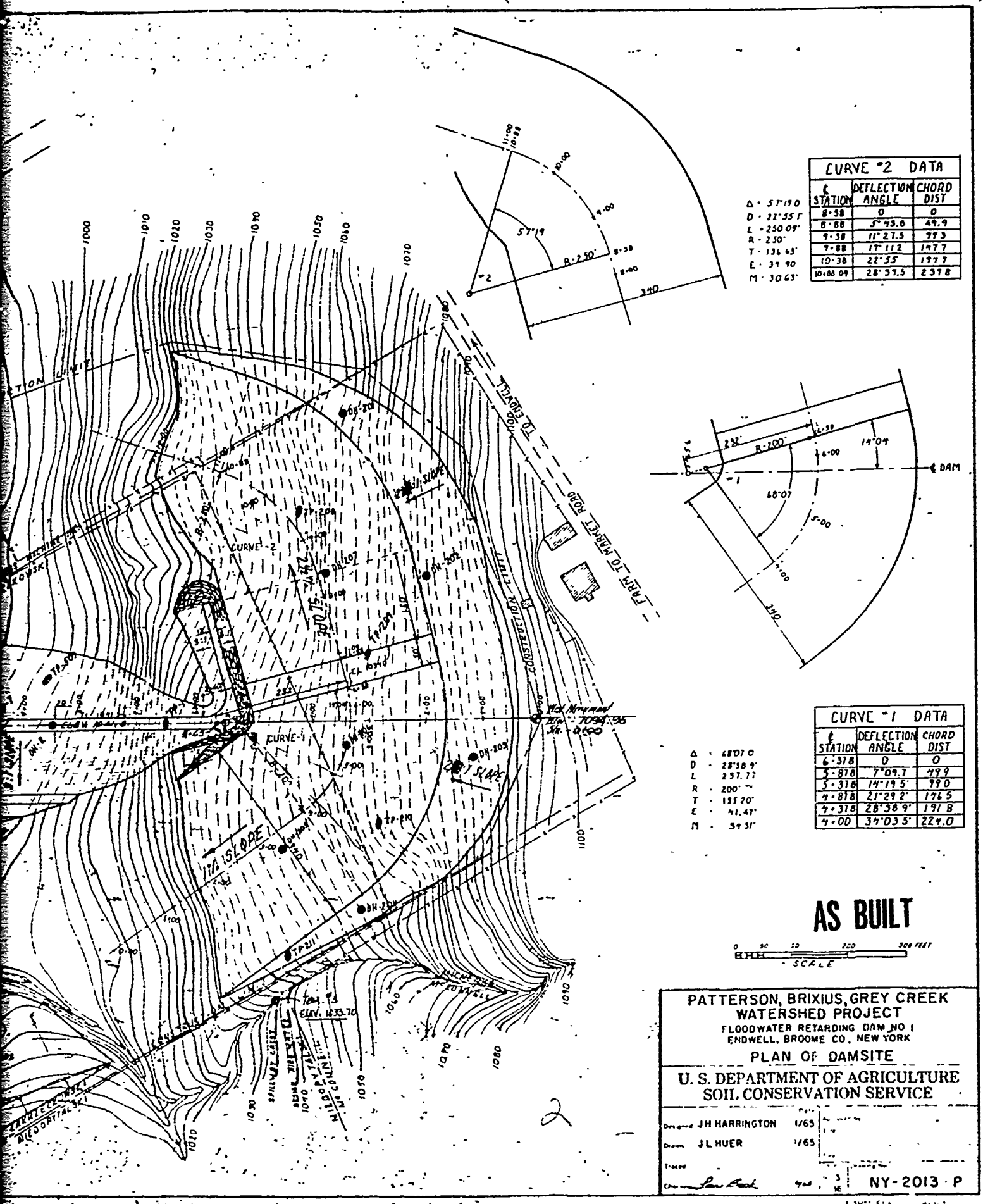
PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO I
ENDWELL BROOME CO. NEW YORK
COVER SHEET

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed Ben Germano 6-65
Drawn M. NIKOLICH
Traced
Checked Tim Lack 7-65

NY-2013-P


LEGEND
SURVEY HUB
ROAD
STREAM
CONTOUR
FENCE EXISTING
SEDIMENT POOL SURFACE
CREST OF EMERGENCY SPILLWAY SURFACE
DESIGN HIGH WATER SURFACE
CONSTRUCTION LIMIT
PROPERTY LINE
TYPICAL CROSS SECTION OF EXIT CHANNEL
STRUBELL ROAD
CONSTRUCTION LIMIT
ACCESS RD.
SUPPLEMENTAL BORROW AREA
CURVE-1
CURVE-2
3:1 SLOPE
2½:1 SLOPE
1½:1 SLOPE
SEDIMENT POOL
TP-501
TP-502
TP-503
TP-504
TP-505
TP-506
TP-507
TP-508
TP-509
TP-510
TP-511
TP-101
TP-102
TP-103
TBM-5
STA. 12+44 ℄ DAM
STA. 2+50 ℄ PRINC SPWY.
EL. 1006.0
EL. 1005.0
EL. 992.5
CLEARING LIMITS
℄ CLEARED ℄
ELEV. 998.0



CURVE #2 DATA		
℄ STATION	DEFLECTION ANGLE	CHORD DIST
8+38	0	0
8+88	5°43.6	49.9
9+38	11°27.5	99.3
9+88	17°11.2	147.7
10+38	22°55	193.7
10+88.09	28°37.5	237.8

Δ = 57°19.0
D = 22°55.1'
L = 250.09'
R = 250'
T = 136.63'
E = 39.90
M = 30.63'

CURVE #1 DATA		
℄ STATION	DEFLECTION ANGLE	CHORD DIST
6+38	0	0
5+88	7°09.7	49.9
5+38	14°19.5'	99.0
4+88	21°29.2'	146.5
4+38	28°38.9'	191.8
4+00	34°03.5'	224.0

Δ = 68°07.0
D = 28°38.9'
L = 237.77
R = 200'
T = 135.20'
E = 41.47'
M = 34.31'

PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT

FLOODWATER RETARDING DAM NO 1
ENDWELL, BROOME CO., NEW YORK

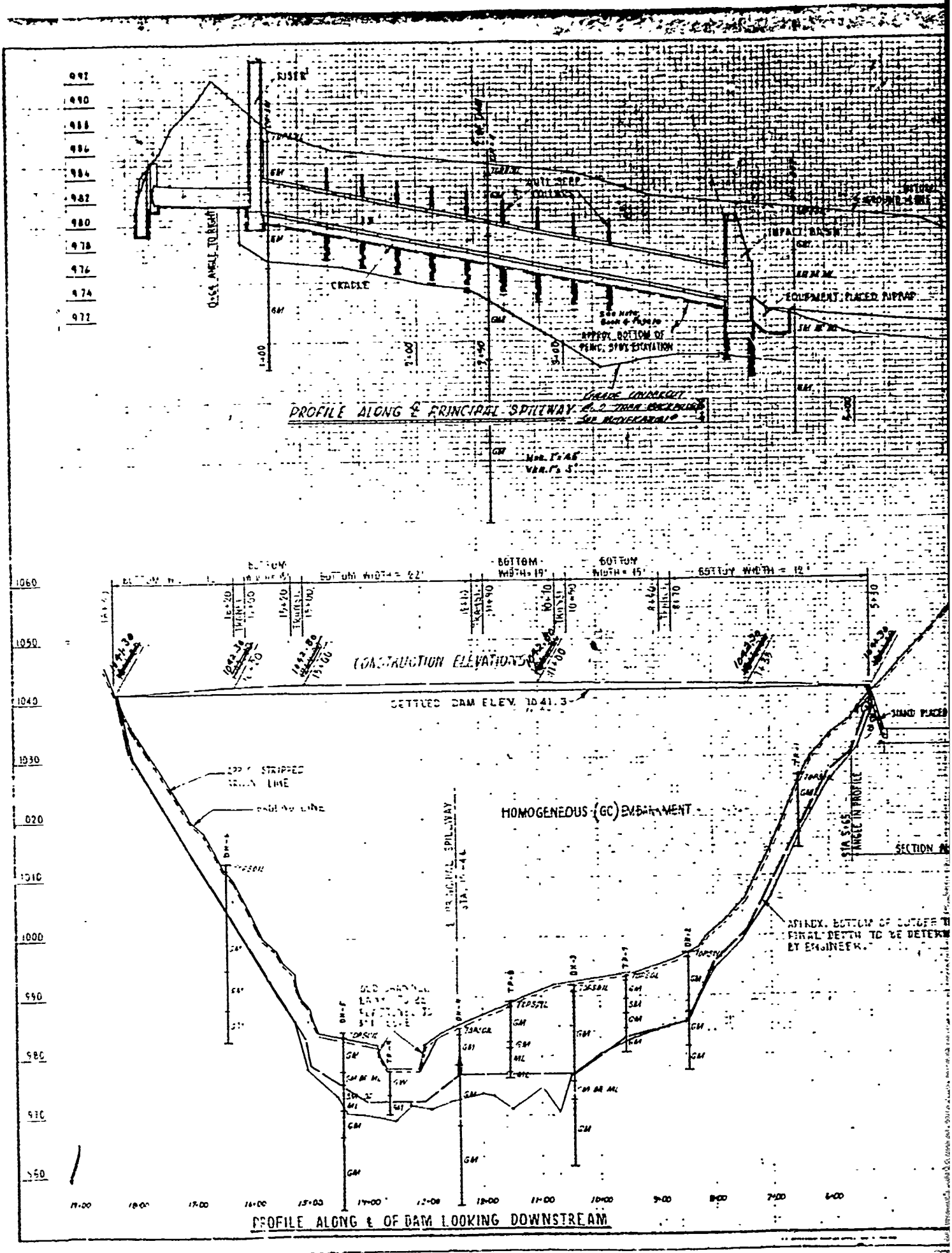
PLAN OF DAMSITE

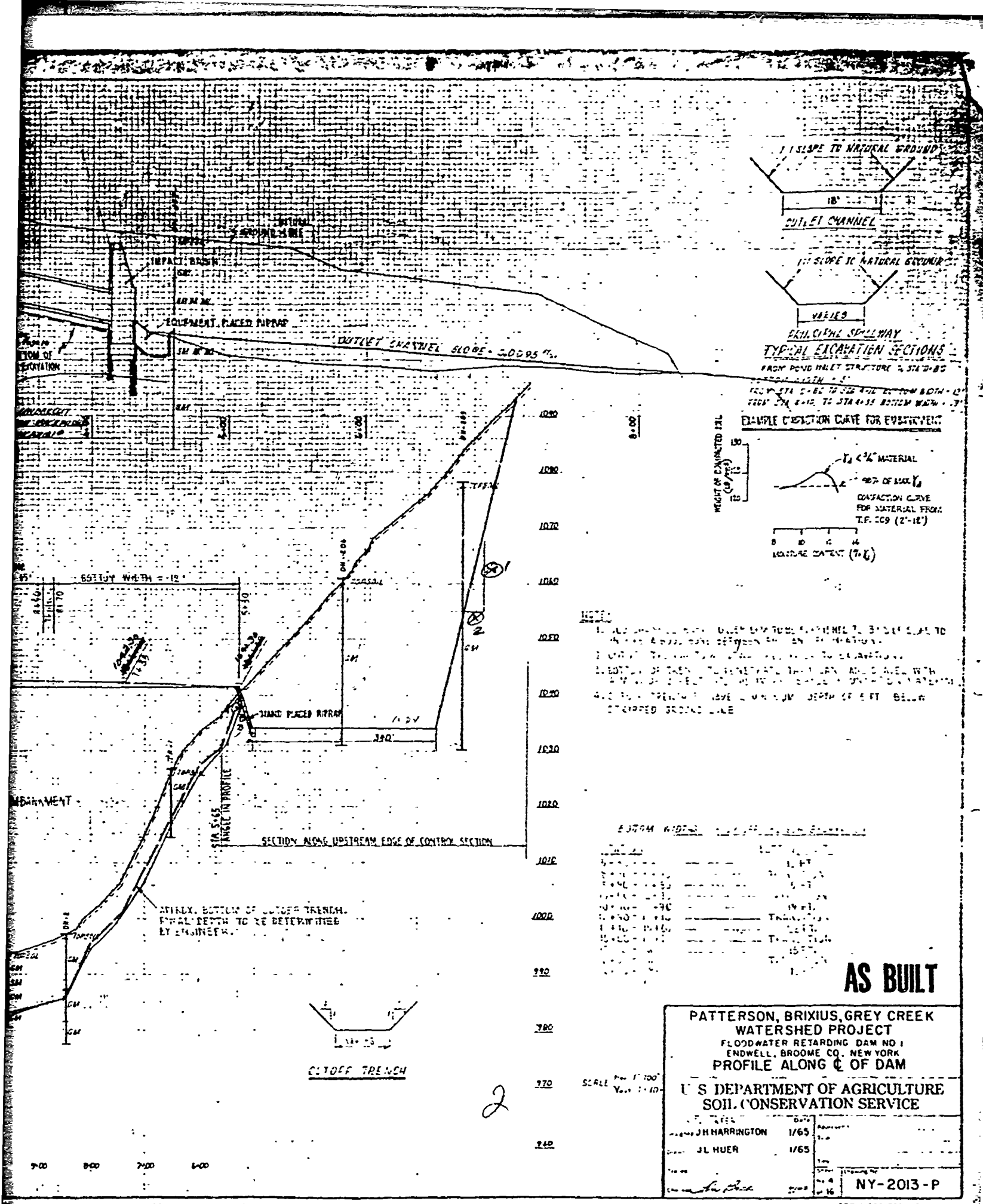
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	J H HARRINGTON	1/65
Drawn	J L HUER	1/65
Traced		
Checked		

Sheet 3 of 16

NY-2013-P


RISER
CRADLE
EQUIPMENT PLACED RIPRAP
PROFILE ALONG ℄ PRINCIPAL SPILLWAY
BOTTOM WIDTH = 22'
BOTTOM WIDTH = 19'
BOTTOM WIDTH = 15'
BOTTOM WIDTH = 12'
CONSTRUCTION ELEVATIONS
SETTLED DAM ELEV. 1041.3
HOMOGENEOUS (GC) EMBANKMENT
PROFILE ALONG ℄ OF DAM LOOKING DOWNSTREAM



AS BUILT

PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
ENDWELL, BROOME CO., NEW YORK
PROFILE ALONG ℄ OF DAM

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

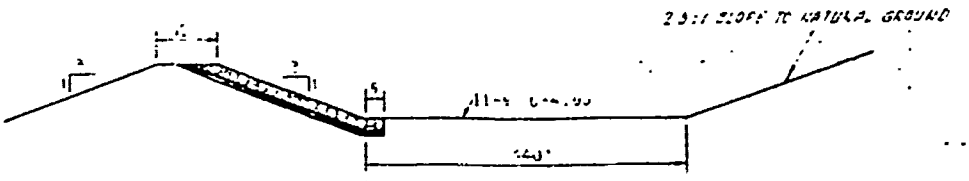
DESIGNED	JH HARRINGTON	1/65
DRAWN	JL HUER	1/65
TRACED		
CHECKED		

SCALE Hor. 1" = 100' Ver. 1" = 10'

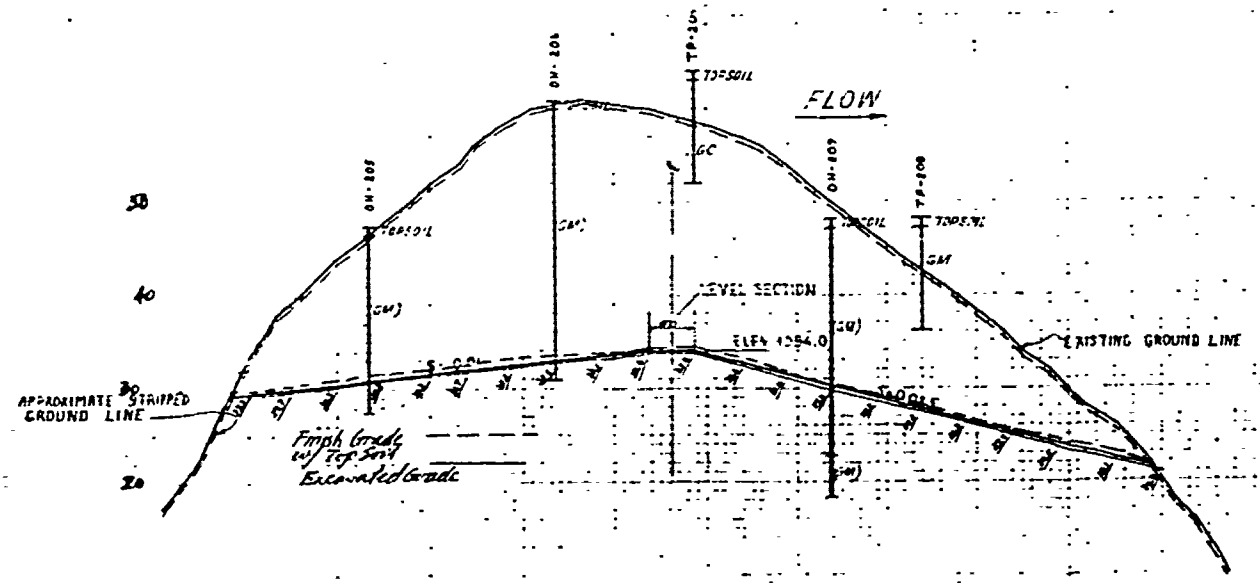
NY-2013-P

2

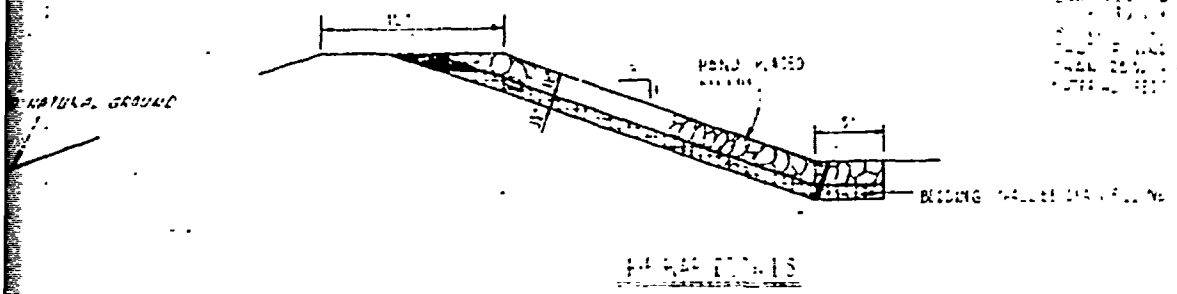
FORM SCS 315 (APR. 1...

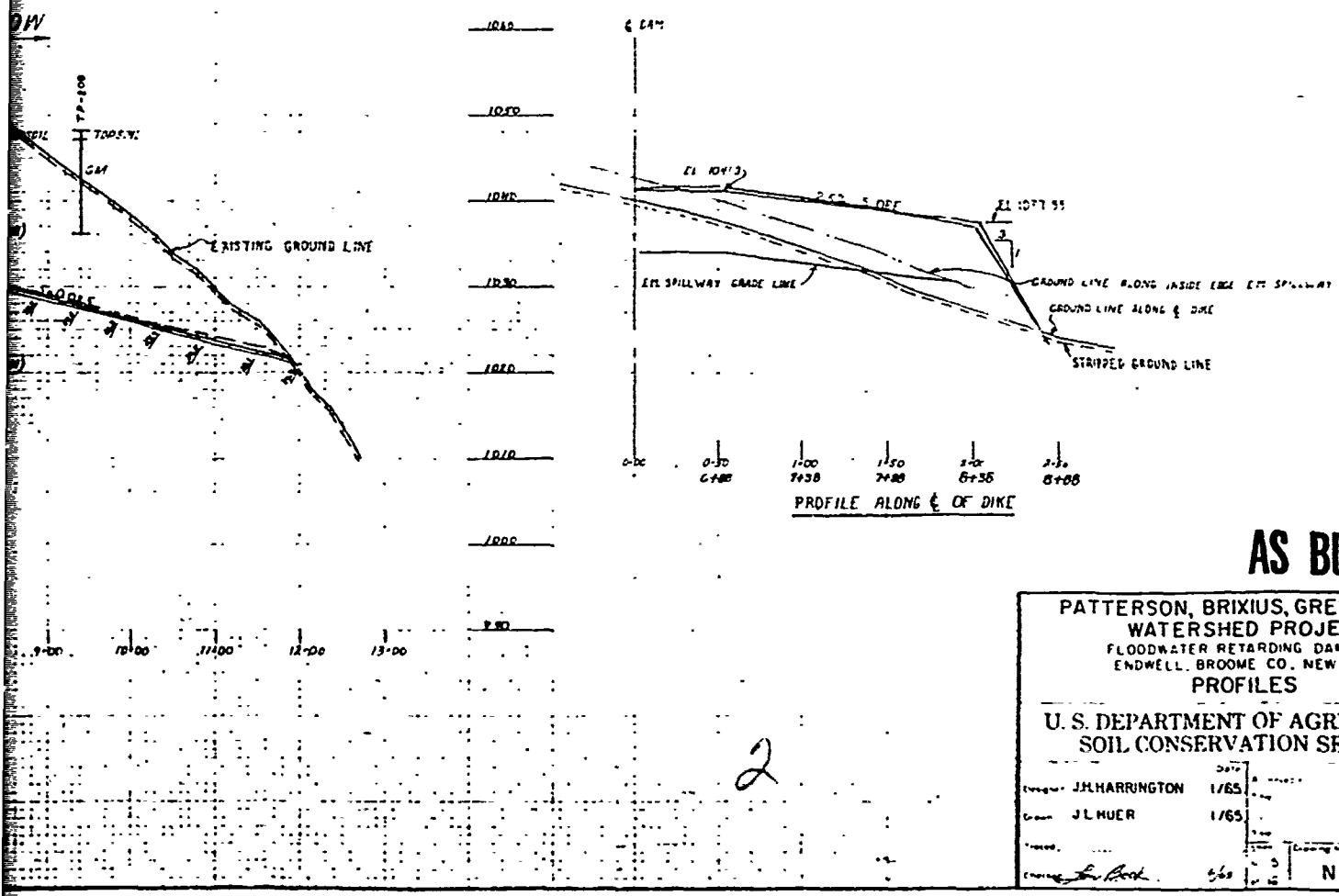


TYPICAL SECTION OF EMERGENCY FLOOD CONTROL SECTION (FPE)



PROFILE ALONG ℄ OF EMERGENCY SPILLWAY





PROFILE ALONG ℄ OF DIKE

AS BUILT

PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
ENDWELL, BROOME CO., NEW YORK
PROFILES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

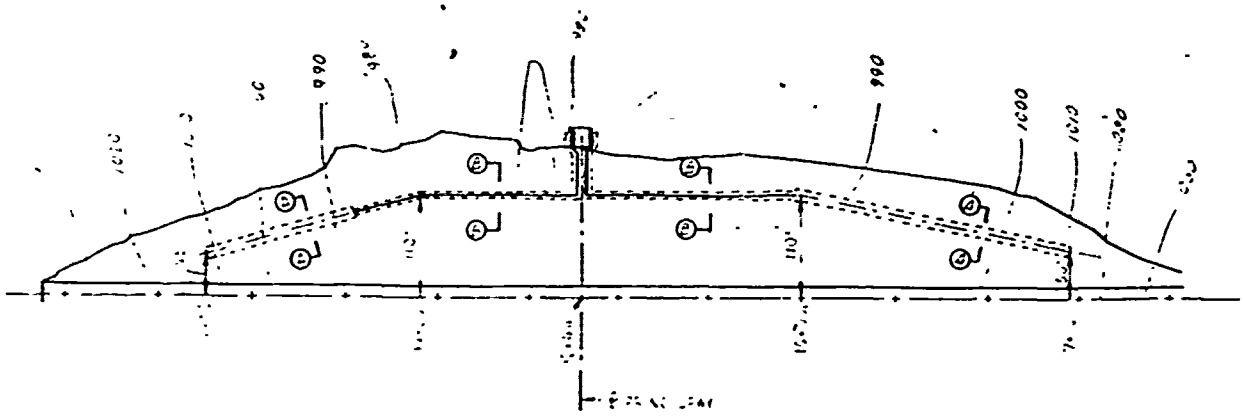
		Date
Designed	J.H.HARRINGTON	1/65
Drawn	J.L.HUER	1/65
Traced		
Checked		1/65

NY-7013-P

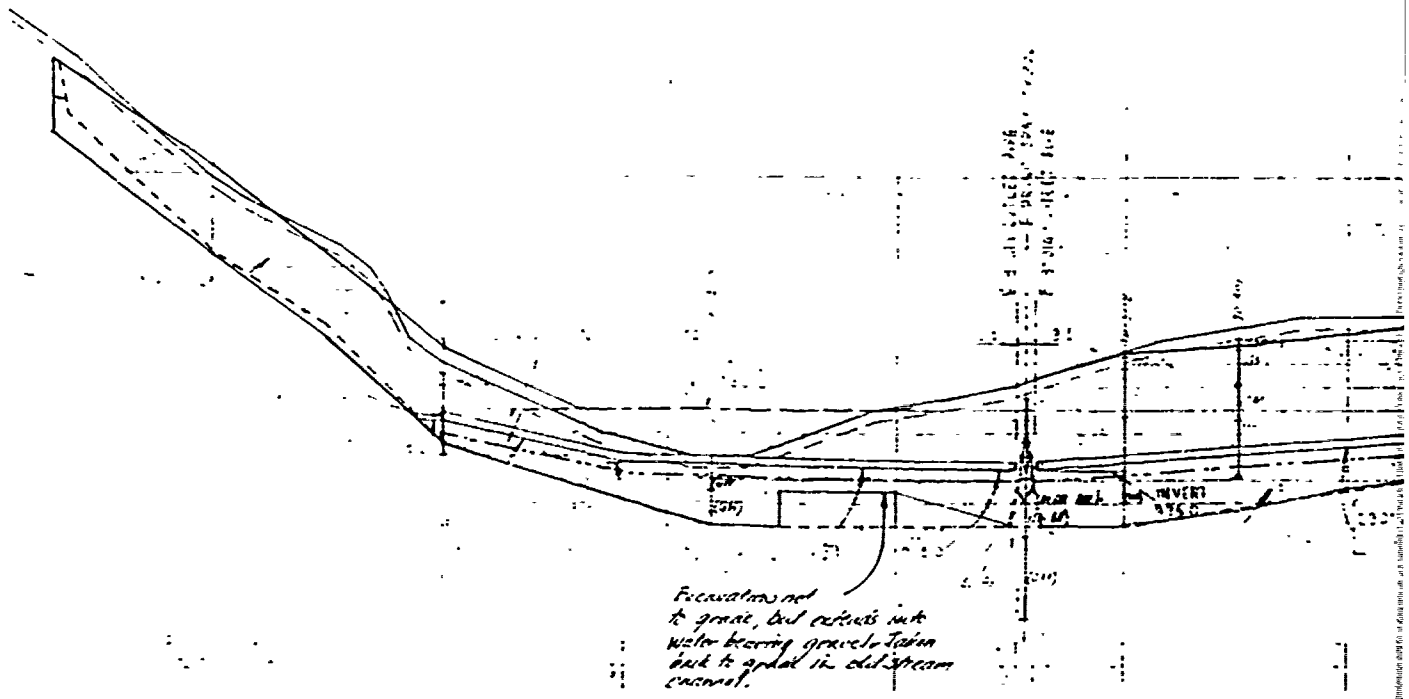
NOTE

FOR QUANTITY SUMMARY

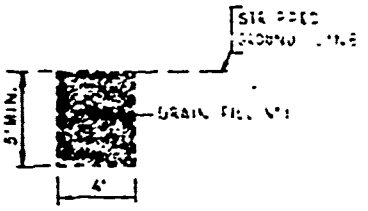
SEE SHEET 7.



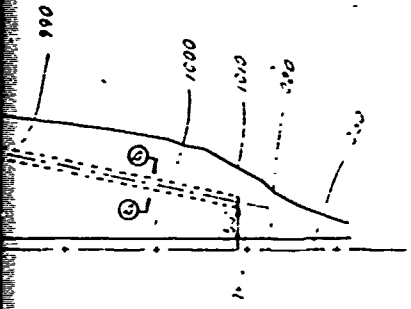
VARIES

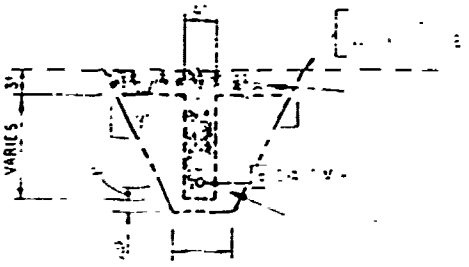


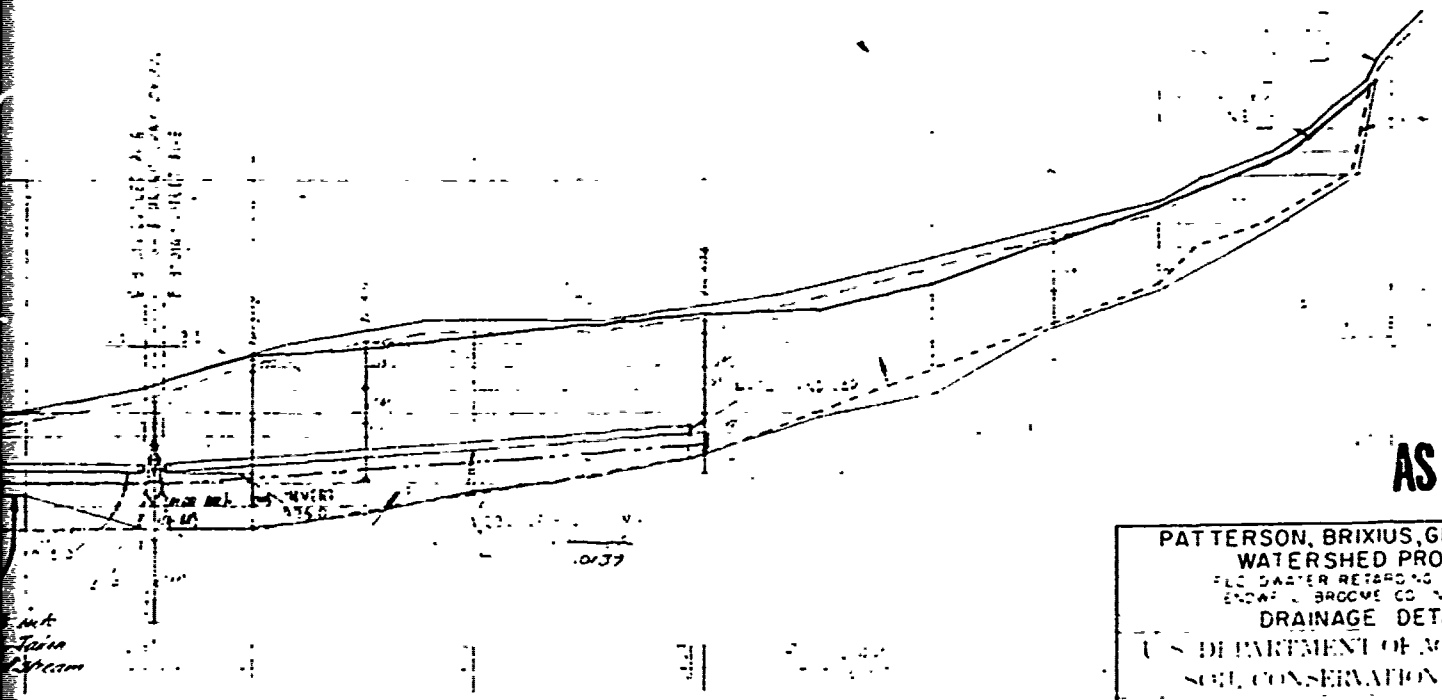
Hor. 1" = 40 Vert. 1"



SECTION AA
STA 7+10 TO STA 12+20
STA 15+00 TO STA 16+30





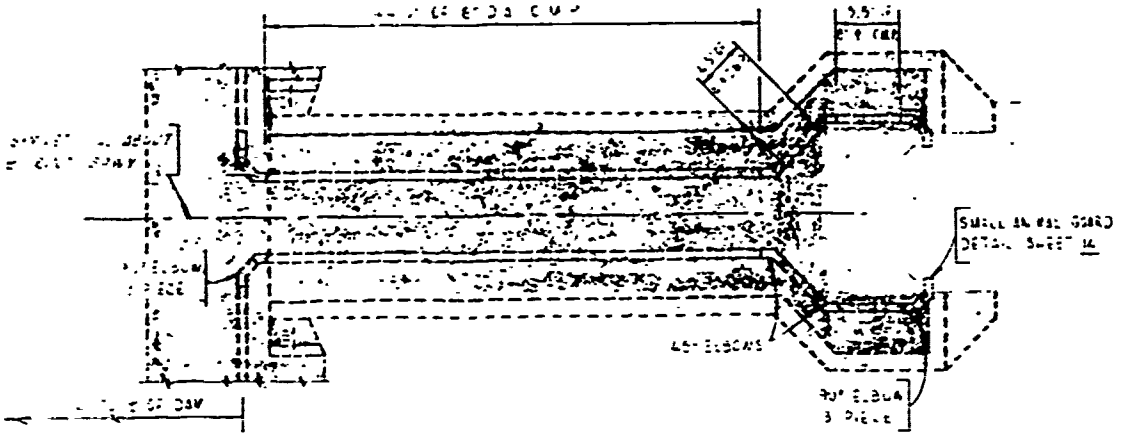


AS BUILT

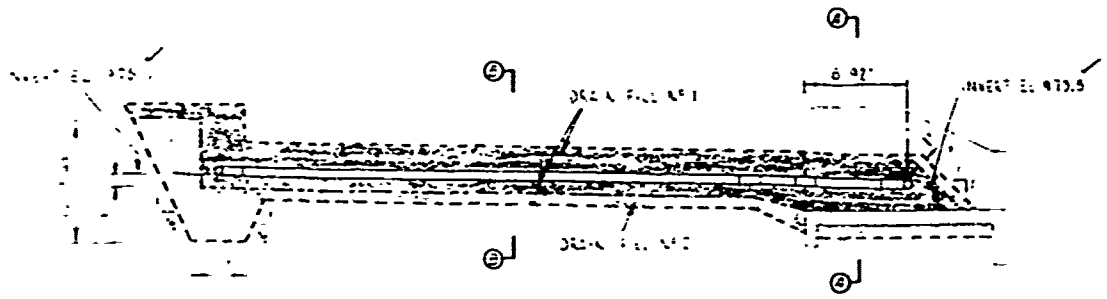
PATTERSON, BRIXIUS, GREY CREEK
WATERSHED PROJECT
FLD. DAMTER RETARDING DAM NO.
BROOME CO. N.Y.
DRAINAGE DETAILS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY-2013-I

2



PLAN OF OUTLET DRAIN

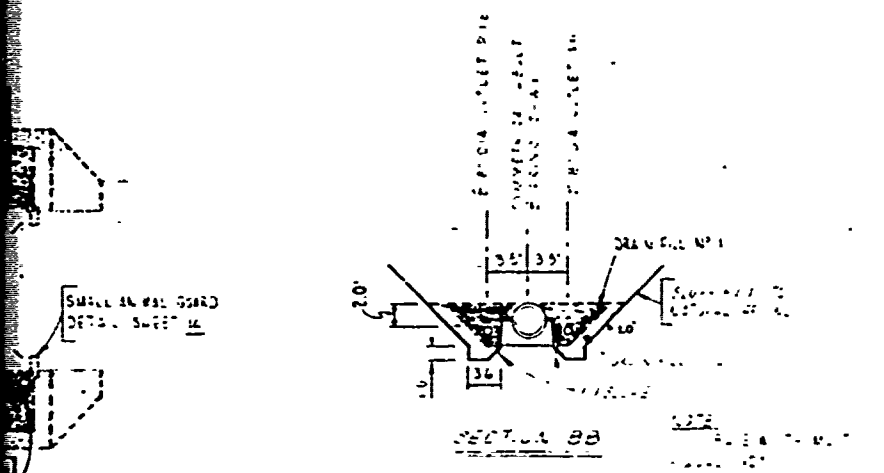


TRENCH SECTION ALONG OUTLET DRAIN PIPE

OUTLET DRAIN DETAILS

NOTE

QUANTITY SUMMARY



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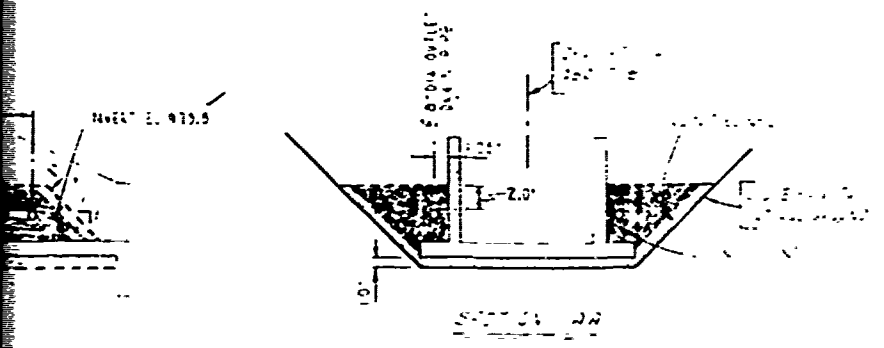
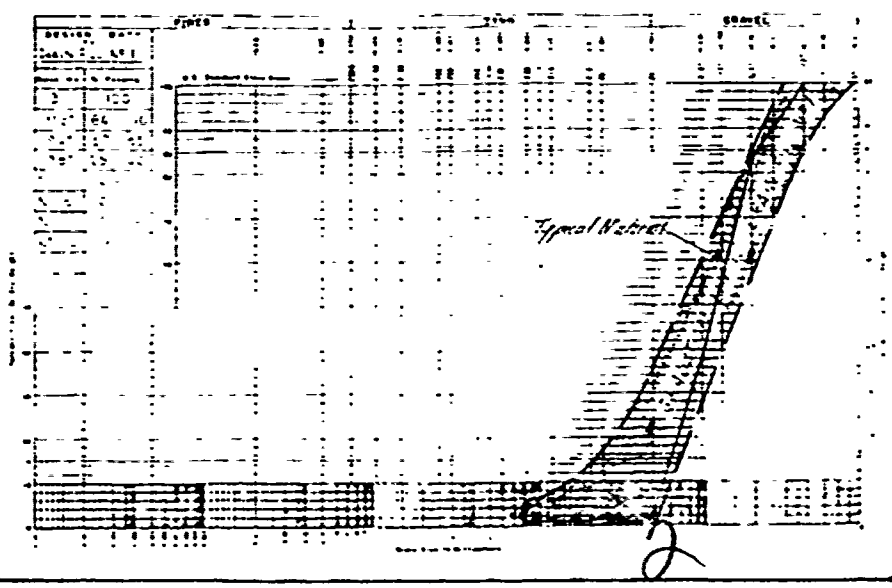
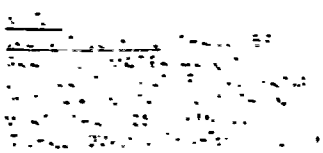


SECTION AA

DETAILS

GRAIN SIZE DISTRIBUTION GRAPH





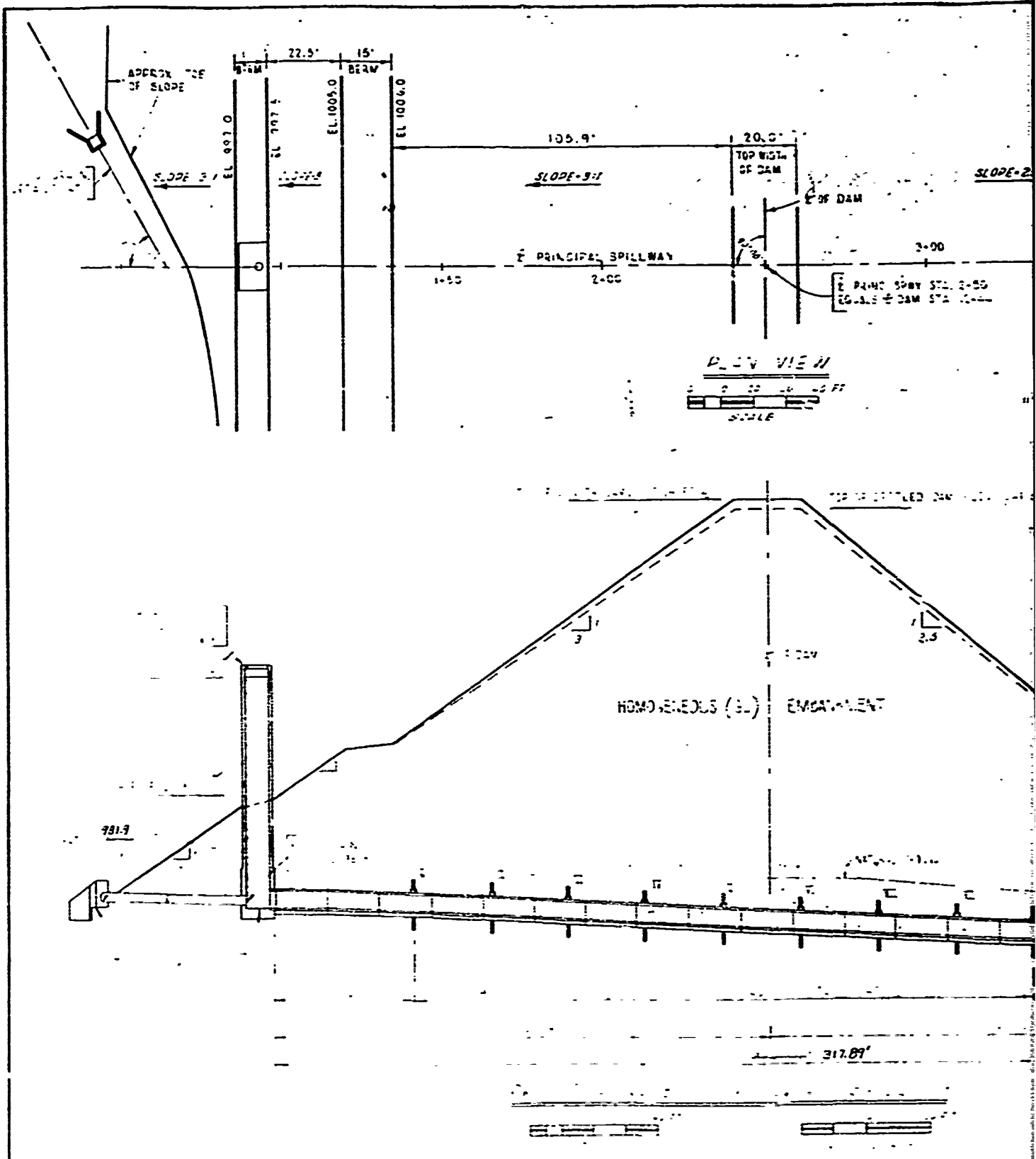
AS BUILT

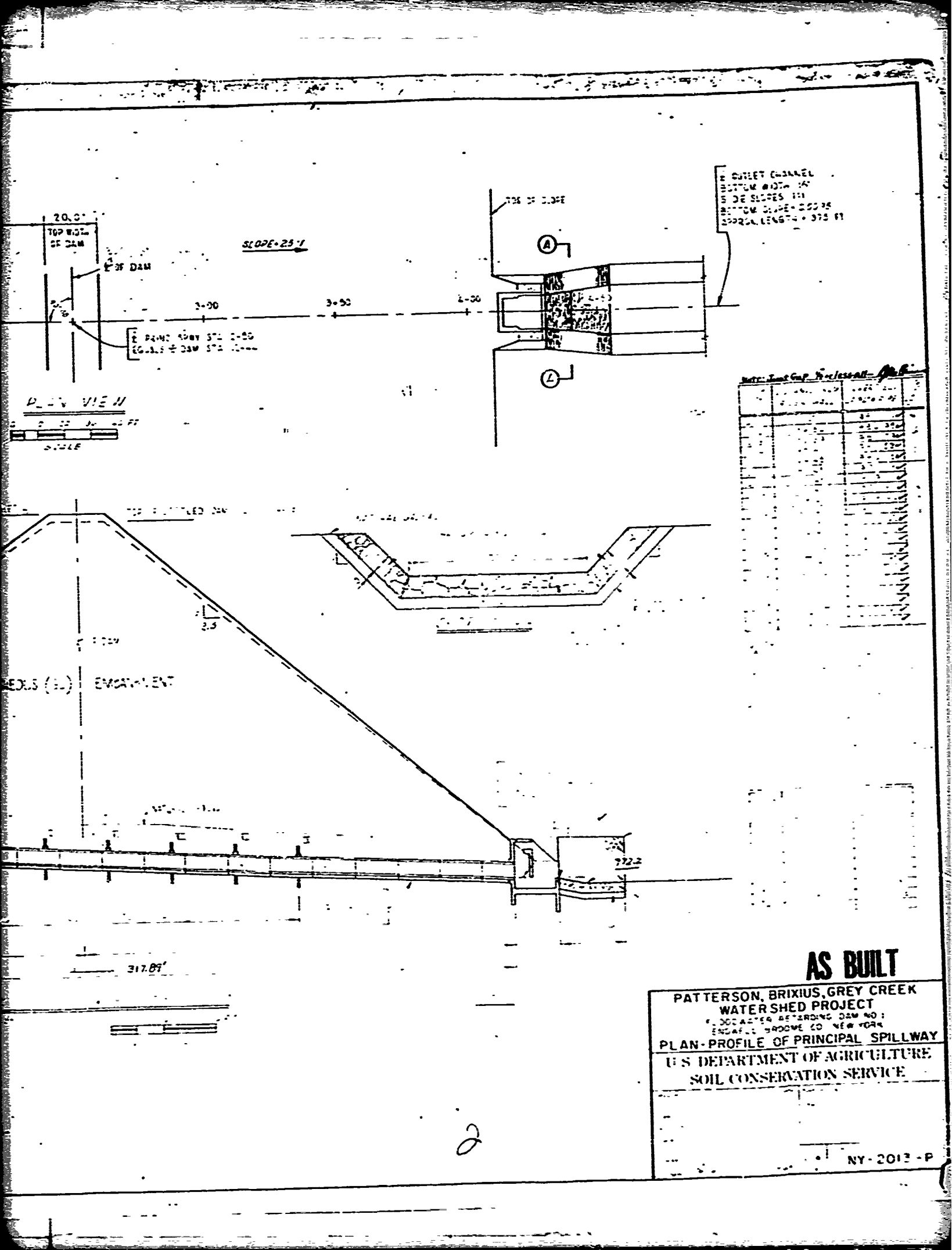
PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
ENDWELL BROOME CO., NEW YORK
DRAINAGE DETAILS

U.S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY-2013-P

Form SCS 311 November 19


APPROX TOE OF SLOPE
22.5'
15'
BERM
EL 997.0
EL 1005.0
EL 1006.0
105.9'
20.0'
TOP WIDTH OF DAM
SLOPE-3:1
SLOPE-2
℄ OF DAM
℄ PRINCIPAL SPILLWAY
1+00
2+00
3+00
PLAN VIEW
SCALE
HOMOGENEOUS (SL) EMBANKMENT
981.9
317.89'



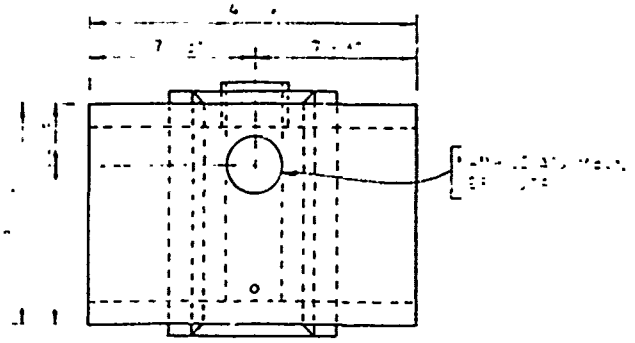
AS BUILT

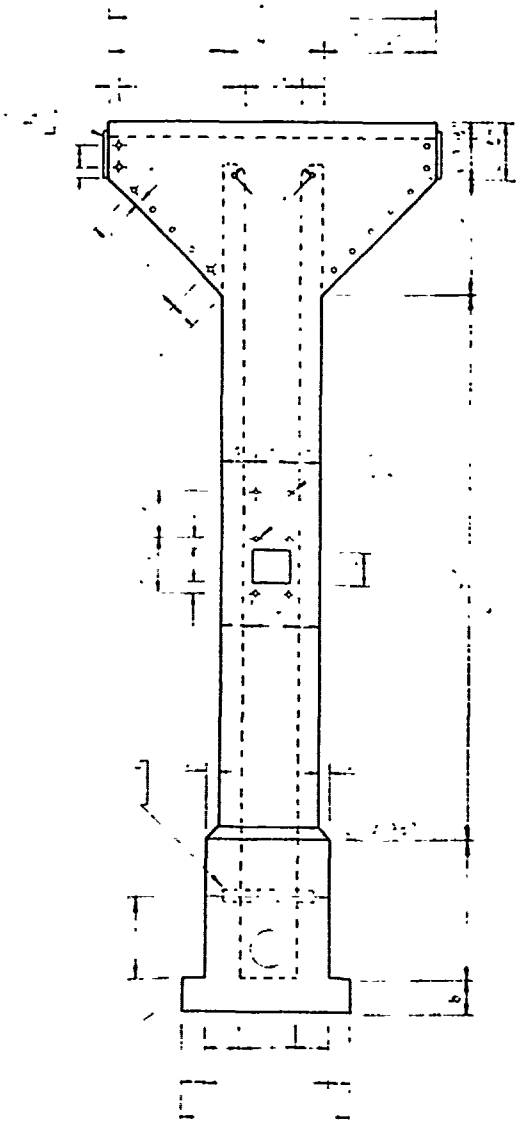
PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
DOCASTER RESERVOIR DAM NO 1
BROOME CO NEW YORK
PLAN-PROFILE OF PRINCIPAL SPILLWAY

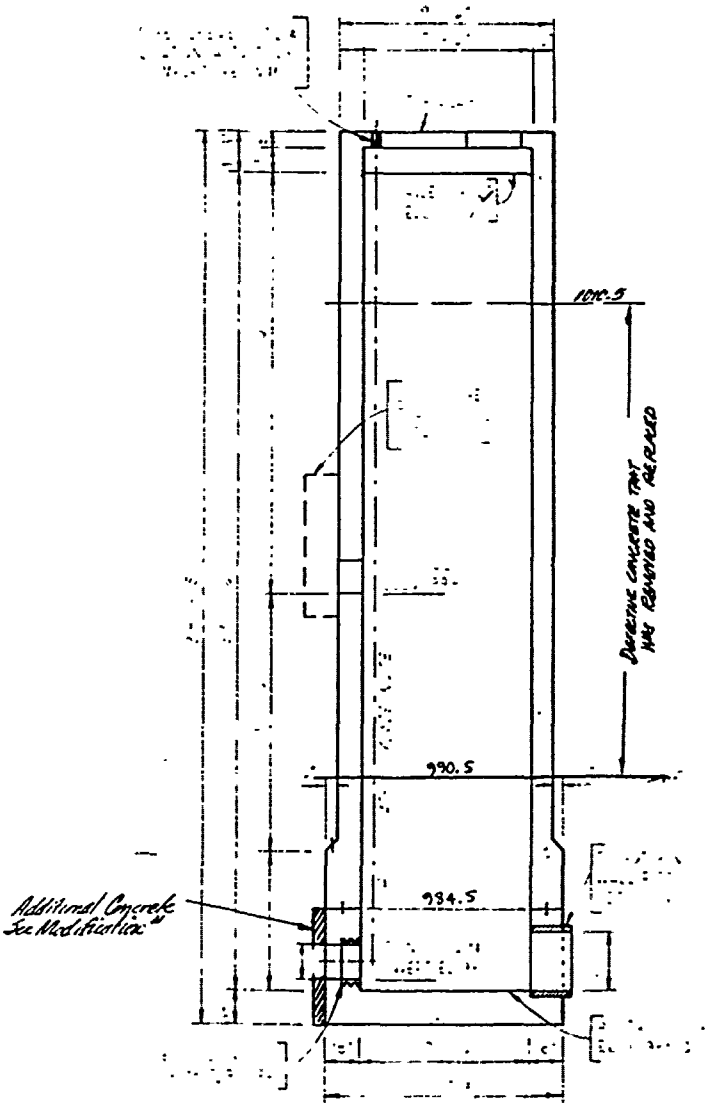
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY-2013-P

2






100.5
DEFECTIVE CONCRETE THAT HAS CRACKED AND SPALLED
990.5
984.5
Additional Concrete See Modification

SLIDE GATE NOTES

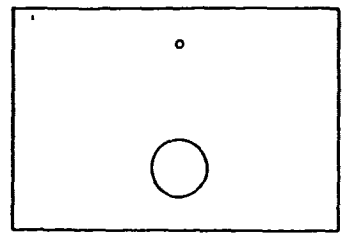
1. 18" DIA SLIDE GATE
2. FLAT FRAME
3. E TYPE ADJ. [illegible] MANHOLE 9" DEEP
4. [illegible] 0
5. [illegible] 38"
   [illegible] 38"
6. [illegible]
7. [illegible]
8. [illegible]
9. STEM [illegible]

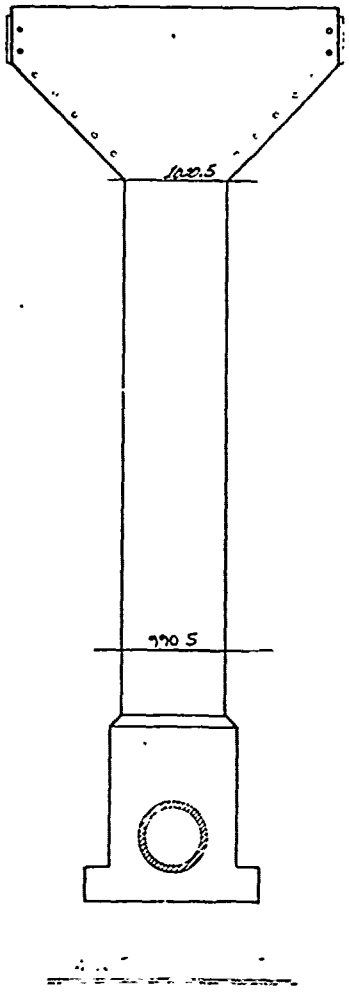
SUPPLIED: RODNEY HUNT MODEL 180

MANHOLE ASSEMBLY NOTE

1. 30 DIA MANHOLE COVER WITH UNDERSIDE HOOKS AND A 1" DIA MIN ROUND HOLE LIFTING DEVICE
2. PAINT IN ACCORDANCE WITH CONST SPEC 22

SUPPLIED: NEENAH FOUNDRY MODEL R-5900A





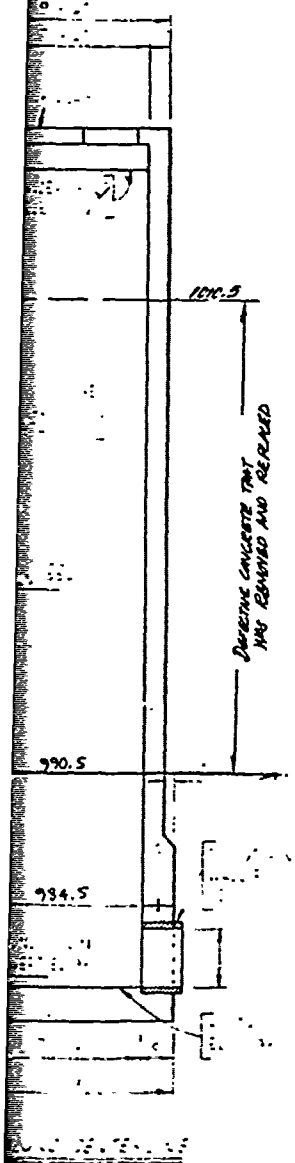


PLATE CONSTR JOINT

AS BUILT

PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
ENDWELL BROOME CO., NEW YORK
RISER - STRUCTURAL DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY-2013-P

2

TP 1, C/L ELEV. 1024.7

0	1	Topsoil
1	12	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)

DH 2, C/L ELEV. 997.3

N =

	0.0	Topsoil
40	1.0	
100		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
72		
39		
53		
74	10.0	
77		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till - w/some sands & thin lenses of gravel. (GM)
82		
66		
69	15.7	
91		
64		
74		
	20.0	

DH 3, C/L ELEV. 991.7

N =

	0.0	Topsoil
39	1.0	
95		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded -brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
117		
52		
63		
59		
44		
86		
82	16.0	
95		Sand, possibly 45% silt fraction - very fine some weak bedding noted - brown - saturated - slowly permeable - probably Wisconsin lacustrine associated with Binghamton drift - hard. (SM or ML)
41		
46		
	19.1	
53		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
38		
37		
51		
29		
59		
62	30.0	

TP 3A, C/L ELEV. 991.7

0	1	Topsoil
1	7	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense - slight increase in fines from 5'-7'. D.S. 3A Comp. (GM)
		[illegible] (GP)
		[illegible]

TP 4, C/L ELEV. [illegible]

	[illegible]	Topsoil
		[illegible] (GM)
		[illegible] (GP)
		[illegible]

Note: [illegible] doubtful.

DH 5, C/L ELEV. 994.2

N =

	0.0	Topsoil
29	1.0	
35		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
27		
32		
	6.6	
Tube Splr.		Silt, occasional pebbles & fine gravels - some weak bedding - gray - wet - very slowly permeable - glacio-lacustrine, Binghamton drift - very stiff. (SM or ML)
36		
	9.0	
47		Sand, possibly 45% silt fraction - very fine - some weak bedding noted - brown - saturated - slowly permeable - probably Wisconsin lacustrine associated with Binghamton drift - hard. (SM or ML)
Tube Splr.		
	13.3	
45		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
Tube Splr.		
	18.0	
Tube Splr.		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
72		
41		
47		
	30.0	

NOTE: Lens of fine, slightly silty gravel encountered at 20'-21'.

DH 6, C/L ELEV. 1012.7

N =

	0.0	Topsoil
31	1.0	
55		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
64		
53		
55		
66		
83		
56		
54		
40		
54		
74	18.0	
73		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
109		
88		
50		
	24.7	
74		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
54		
53		
50		
	30.0	

TP 7, C/L ELEV. 993.5

0	1	Topsoil
1	4	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense. D.S. 7 Comp (GM)
4	6.5	Increase in sand fraction & decrease in gravels - wet. (SM)
6.5	9.0	Gravel, slightly dirty - about 15% fines - occasional 4"-6" cobbles, subrounded - gray brown - saturated with very slight seepage - moderately permeable - Wisconsin age - dense - probably glacial till. D.S. 7.1 (GM)
9.0	13.0	Gravel, slightly dirty - about 15% fines - occasional 4"-6" cobbles, subrounded - gray - saturated with moderate seepage - moderately permeable - Wisconsin age - dense - probably glacial till. D.S. 7.2 (9'-13'), 7.3 (13'+) (GM)

TP 8, C/L ELEV. 999.2

0	1	Topsoil
1	7	Gravel, well graded down to about some 4"-6" subrounded cobbles - wet - slow to moderate permeabil age, Binghamton drift (possibly mixed in) - dense. D.S. 8 Com (GM)
7	8	Gravel, quite silty w/some sands +6" cobbles & flags (approx. 15% angular to subrounded - bluish gr wet - slowly permeable - Wisconsi Binghamton drift - dense to very glacial till. (GM)
8	12	Silt, approx. 10% sand sizes - ro some weak bedding - brown - wet, slowly permeable - Binghamton lac D.S. 8.1 (SM or ML)
12	13	Silt, approx. 10% sand sizes - ro some weak bedding - blue-gray - w seepage - slowly permeable - Bing stiff. D.S. 8.2 (SM or ML)

TP 9, C/L ELEV. 977.8

0	4	Gravel, alluvial - clean - brown below 2' w/heavy seepage - rapidl medium to dense. (GP)
4	7.5	Sand, medium to fine, quite silty gray - wet to saturated - slow to permeable - Binghamton lacustrine (SM or ML)

NOTE: This pit dug under H_2O, therefore i to log accurately.

TP 101, Borrow, ELEV. 1001.0

0	1	Topsoil
1	11	Gravel, quite silty w/some sands +6" cobbles & flags (approx. 15% angular to subrounded - brown - m slowly permeable - Wisconsin age, drift - dense to very dense - gla (GM)

NOTE: Below 6' in this test pit, there is increase in 8"-10" flags.

TP 102, Borrow, ELEV. 1009.0

0	1	Topsoil
1	11	Gravel, quite silty w/some sands +6" cobbles & flags (approx. 15% angular to subrounded - brown - m slowly permeable - Wisconsin age, drift - dense to very dense - glac (GM)

NOTE: Below 6' in this test pit, there is increase in 8"-10" flags.

DH 201 Borr Spill., ELEV. 1057.9

N =

	0.0	Topsoil
	1.0	
Tube Splr.		Gravel, quite silty w/some san numerous +6" cobbles & flags (+3") - subangular to subrounde moist to wet - slowly permeabl age, Binghamton drift - dense glacial till. (GM)
15.0		
65		
62		
66		
77		
79		
81		NOTE: Driller indicated a siltier m
61		from 27'-32'. He had poor re
62		I checked the samples I did n
92		it is possible that there is
90		here.
77	45.0	

DH 202 Borr. Spill., ELEV. 1075.1

	0.0	Topsoil
	1.0	
		Gravel, quite silty w/some san eous +6" cobbles & flags (appro subangular to subrounded - bro wet - slowly permeable - Wisco Binghamton drift - dense to ve glacial till. (GM)
	15.0	
		Gravel, quite silty w/some san eous +6" cobbles & flags (appro subangular to subrounded - gra moist to wet - slowly permeabl age, Binghamton drift - dense glacial till. (GM)
	30.0	
		Gravel, quite silty w/some san eous +6" cobbles & flags (appro subangular to subrounded - bro wet - slowly permeable - Wisco Binghamton drift - dense to ve glacial till. (GM)
	45.0	

NOTE: This hole sampled at 5' intervals w/dry as used to advance hole.

TP 8, C/L ELEV. 991.2

0	1	Topsoil
1	7	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense. D.S. & Comp.
7	8	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - bluish gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
8	12	Silt, approx. 10% sand sizes - rock flour - some weak bedding - brown - wet, w/minor seepage - slowly permeable - Binghamton lacustrine - stiff. D.S. 8.1 (ML)
12	13	Silt, approx. 10% sand sizes - rock flour - some weak bedding - blue-gray - wet, w/minor seepage - slowly permeable - Binghamton lacustrine - stiff. D.S. 8.2 (ML)

TP 9, C/L ELEV. 977.8

0	4	Gravel, alluvial - clean - brown - saturated below 2' w/heavy seepage - rapidly permeable - medium to dense. (GW)
4	7.5	Sand, medium to fine, quite silty - bluish gray - wet to saturated - slow to moderately permeable - Binghamton lacustrine - stiff. (SM)

NOTE: This pit dug under H_2O, therefore it was difficult to log accurately.

TP 101, Borrow, ELEV. 1001.0

0	1	Topsoil
1	11	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)

NOTE: Below 6' in this test pit, there is a noticeable increase in 8"-10" flags.

TP 102, Borrow, ELEV. 1009.0

0	1	Topsoil
1	11	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)

NOTE: Below 6' in this test pit, there is a noticeable increase in 8"-10" flags.

DH 201, Emer. Spill., ELEV. 1057.9

N =

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
Tube Splr.	15.0	
65		
62		
66		
77		
79		
81		NOTE: Driller indicated a siltier material from 27'-32'. He had poor recovery but when I checked the samples I did not notice this— it is possible that there is a silt zone here.
61		
62		
92		
90		
77	45.0	

DH 202, Emer. Spill., ELEV. 1075.1

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
	15.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
	30.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
	45.0	

NOTE: This hole sampled at 5' intervals w/dry tube splr. and is used to balance hole.

DH 203, Emer. Spill., ELEV. 1078.2

N =

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
148		
Tube Splr		
90		
Tube Splr		
64		
48		
121		NOTE: Driller interpreted a zone of "silty till w/thin silt lenses" from 10'-20'. I could not pick this up clearly from the samples.
Tube Splr		
Tube Splr		
150		
175	40.0	

DH 204, Emer. Spill., ELEV. 1054.5

N =

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. Driller noted some thin lenses of medium gravel in the 24'-25' zone. (GM)
RB		
88		
RB		
50		
RB		
47		
RB		
34		
RB		
45	25.0	

DH 205, Emer. Spill., ELEV. 1047.5

N =

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
RB		
Tube		
Splr		
RB		
Tube		
Splr		NOTE: Color change to a grayish brown at about 15'.
RB		
Tube		
Splr	20.0	

DH 206, Emer. Spill., ELEV. 1040.9

N =

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
RB		
Tube		
Splr		
RB		
Tube		
Splr		
58		
41		NOTE: Driller logged a zone of "higher boulder content" from 15.5 to 25.5.
78		
88	30.0	

DH 207, Emer. Spill., ELEV. 1048.1

N =

	0.0	Topsoil
	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
RB		
Tube		
Splr		
RB		
Tube		
Splr		
RB		
34		
	25.5	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
43		
RB		
40	30.0	

TP 209, Emer. Spill., ELEV. 1044.2

0	1	Topsoil
1	12	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. D.S. 209.1 (GM)

TP 209, Emer. Spill., ELEV. 1064.0

0	1	Topsoil
1	12	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till D.S. 209.1 (GM)

2

TP 210, Emer. Spill., ELEV. 1046.0

0	1	Topsoil
1	12	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. D.S. 210.1 (GM)

TP 211, Emer. Spill., ELEV. 1042.0

0	1	Topsoil
1	12	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)

DH 301, Prin. Spill., ELEV. 987.8

N =

	0.0	Topsoil
13	1.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
29		
36		
59	6.0	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
46		
30	11.5	
101		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
RB		
62		
68		
67		
66	20.0	

NOTE: Several layers of pure brown sand noted in the 12'-15' zone.

DH 302, Prin. Spill., ELEV. 981.0

	0.0	Topsoil
18	1.0	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (Possibly some Recent mixed in) - dense (GM)
51		
20	3.7	
19		Silt, occasional pebbles & fine gravels - some weak bedding - gray - wet - very slowly permeable - glacio-lacustrine, Binghamton drift - very stiff. (SM or ML)
13		
16	9.0	
16		Sand, possibly 45% silt fraction - very fine - some weak bedding noted - brown - saturated - slowly permeable - probably Wisconsin lacustrine associated with Binghamton drift - hard. Noted "some water bearing gravel streaks" - brown - saturated. (SM or ML)
18	11.9	
42		Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - grayish brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
52		
41		
49	19.0	

AS BUILT

(XX) FIELD CLASSIFICATION BY VISUAL INSPECTION

XX UNIFIED SOIL CLASSIFICATION BY THE LABORATO

PATTERSON, BRIXIUS, GREY CREEK
WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 1
ENDWELL BROOME CO., NEW YORK
LOGS OF TEST HOLES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY-2013-P

TP 501, D.S. Toe, ELEV. 986.1

0	1	Topsoil
1	4	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense. (GM)
4	7	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
7	12	Silt, approx. 10% sand sizes - rock flour - some weak bedding - brown - wet, w/minor seepage - slowly permeable - Binghamton lacustrine - stiff. (ML)

TP 502, D.S. Toe, ELEV. 984.5

0	1	Topsoil
1	5	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense. (GM)
5	9	Silt, approx. 10% sand sizes - rock flour - some weak bedding - brown - wet, w/minor seepage - slowly permeable - Binghamton lacustrine - stiff (ML)
9	12.5	Silt, approx. 10% sand sizes - rock flour - some weak bedding - blue gray - wet, w/minor seepage - slowly permeable - Binghamton lacustrine - stiff. (ML)

TP 503, D.S. Toe, ELEV. 976.0

0	3	Gravel, alluvial - clean - brown - saturated (GW) below 2' with heavy seepage - rapidly permeable - medium to dense - Recent.
3	6	Gravel, quite silty w/some sands - numerous (GM) +6" cobbles & flags (approx 15% +3") - subangular to subrounded - blue gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till.

NOTE: Moderately dense from 3'-6' and very dense below 6'.

TP 504, D.S. Toe, ELEV. 987.0

0	1	Topsoil
1	4	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - moist to wet - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense. D.S. 50% Comp. (GM)
4	8	Gravel, well graded down to about 25% fines - some 4"-6" subrounded cobbles - brown - saturated - slow to moderate permeability - Wisconsin age, Binghamton drift (possibly some Recent mixed in) - dense. (GM)
8	10.5	Gravel, fine (pea gravel) - considerable sand - grayish brown - saturated - moderate to rapidly permeable - Wisconsin age, Binghamton drift - compact. (GW)
10.5	13.0	Sand, coarse w/some lenses of medium to fine sand - somewhat runny w/fairly heavy seepage - brown - mod. dense - mod. permeable - saturated. (SP)

TP 505, D.S. Toe, ELEV. 991.5

0	3.5	Gravel, alluvial - clean - brown - saturated (GW) below 2' w/heavy seepage - rapidly permeable - loose - Recent.
3.5	13.0	Sand, medium to fine, quite silty - bluish gray (SM) - wet to saturated - slow to moderately permeable - Binghamton lacustrine - stiff.

TP 506, D.S. Toe, ELEV. 979.3

0	4.5	Gravel, alluvial - clean - brown - saturated (GW) below 2' w/heavy seepage - rapidly permeable - loose - Recent.
4.5	5.0	Sand, coarse, quite silty - bluish gray - wet (SM) to sat. - slow to moderately permeable - Binghamton lacustrine - stiff.

TP 507, D.S. Toe, ELEV. 985.2

0	3.5	Gravel, alluvial - clean - brown - saturated (GW) below 2' - rapidly permeable - loose - Recent.
3.5	5.5	Sand, medium to fine, quite silty - brown - wet to sat. - slow to moderately permeable - Binghamton lacustrine - stiff. (SM)
5.5	11.5	Sand, medium to fine, quite silty - bluish gray (SM) wet to sat. - slow to moderately permeable - Binghamton lacustrine - stiff.

TP 508, D.S. Toe, ELEV. 983.0

0	1	Topsoil
1	4	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
4	7	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - blue gray - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)

TP 509, D.S. Toe, ELEV. 995.3

0	1	Topsoil
1	5	Gravel, quite silty w/some sands - numerous +6" cobbles & flags (approx. 15% +3") - subangular to subrounded - brown - some mottling to gray below 4' - moist to wet - slowly permeable - Wisconsin age, Binghamton drift - dense to very dense - glacial till. (GM)
5	11	Gravel, quite high in sands (sandy till) - brown - saturated (quite easy digging) - mod. permeable - fairly heavy seepage at 8' level (measured 7 g.p.m. flow into test pit) - Binghamton drift (possibly an outwash remnant). (GM-GW)

LEGEND

Test Hole Numbering System

Centerline of dam	1 - 99
Borrow area	101 - 199
Emergency spillway	201 - 299
Centerline of outlet structure	301 - 399
Stream channel	401 - 499
Relief wells	501 - 599

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

GM	Silty gravels; gravel-sand-silt mixtures
ML	Silts; silty, v.fine sands; sandy or clayey silts
SM	Sand, silty
GW	Gravel, clean, well graded.

SAMPLE

DS Disturbed

KEY TO DRILL HOLE (DH) LOGS

N = 22 — N = Number of blows required for 1 ft. standard penetration, using 2.0" O.D. split barrel sampler, 140 lb. hammer, and 30" drop. ASTM D 1586.

9.0 — Depth in hole (ft.)

CL — Unified Soil Classification Symbol

12.0

RB — Roller bit to advance hole by wash boring

17.0 — Depth in hole

RX — Rock core, 2-1/8" diameter

75% — Percent rock core recovery in each drill run

50%

90%

La — Bedrock symbol

FIELD CLASSIFICATION BY VISUAL INSPECTION

XX UNIFIED SOIL CLASSIFICATION BY THE LABORATORY

AS BUILT

PATTERSON, BRIXIUS, GREY CREEK
WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 1
ENDWELL BROOME CO. NEW YORK
LOGS OF TEST HOLES

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY-2013- P

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